FOOD MANUFACTURE

Incorporating Food Industries Weekly

ARD HILL LIMITED, 17 STRATFORD PLACE, LONDON, W.1 MARCH 1, 195

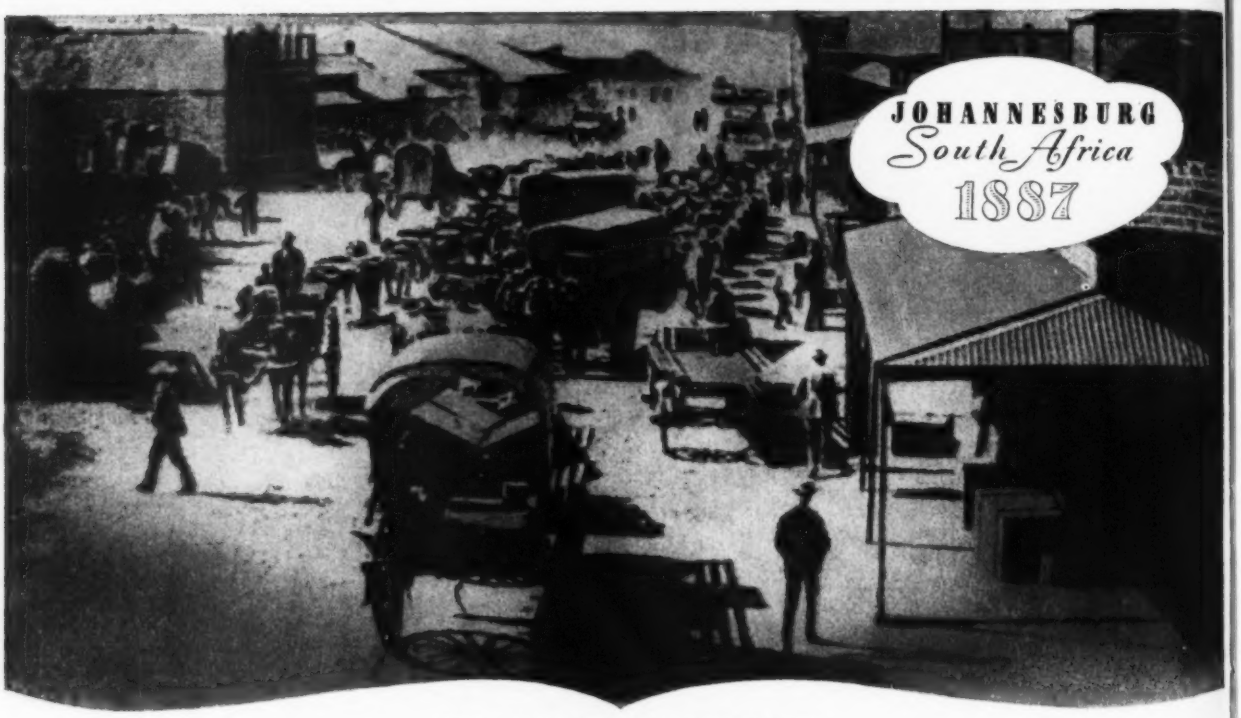
THE **R.O.seal**

PLAIN OR PILFERPROOF

is the made-to-measure closure that fits individual bottles & jars

METAL CLOSURES LTD · WEST BROMWICH · STAFFS

LONDON OFFICE : 40 BROOK STREET W.1



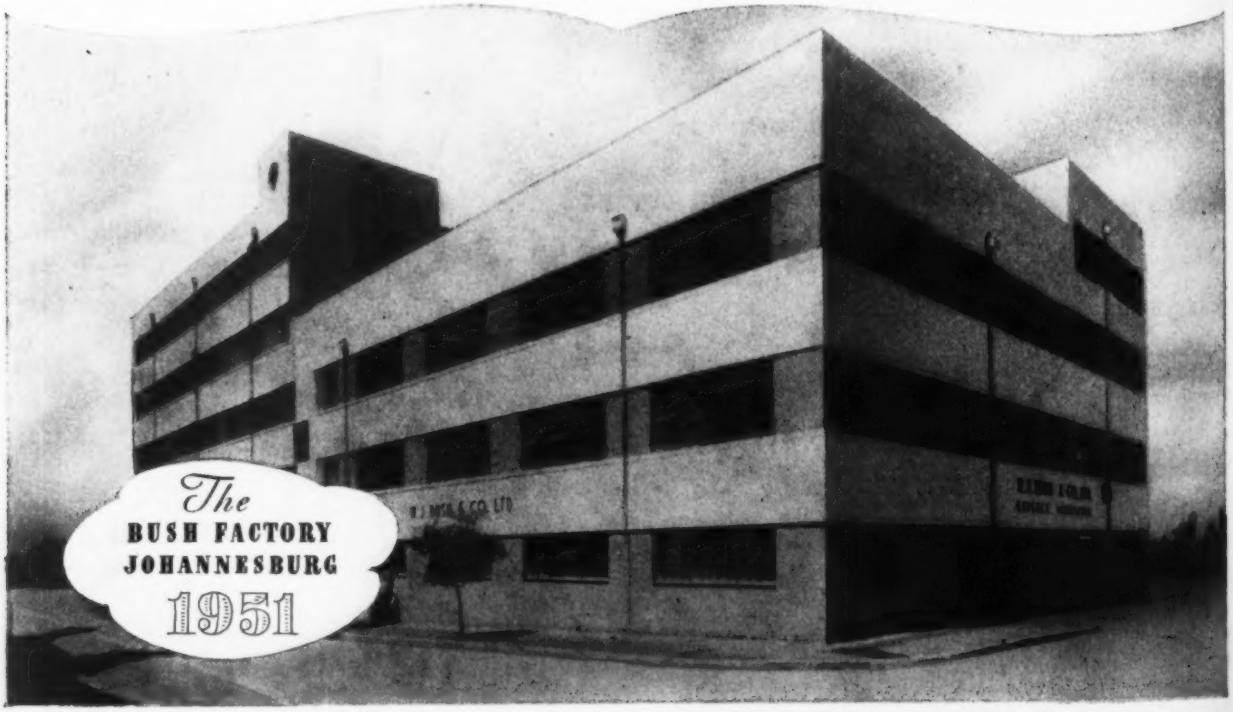
100 YEARS OF SERVICE
1851 1951

Fine and Pharmaceutical Chemicals

BUSH

Essences Essential Oils and Food Colours

W. J. BUSH & CO LTD • LONDON ENGLAND



FOOD MANUFACTURE

Vol. XXVI. No. 3 · Published Monthly · March 1, 1951

CONTENTS

	Page
Editorial	89
The Confectionery Industry. *R. L. Kenny, B.Sc., F.R.I.C.*	93
FAO and National Nutrition	97
Ministry of Food—Latest Statutory Instruments	98
The Higher Alkyl Gallates as Antioxidants. *K. J. H. Van Sluis*	99
Easter Eggs	102
Continuous Butter Production. *N. King*	105
Hydrolysed Meat Proteins	111
National College of Food	112
Food Analysis	113
Trade News	114
Information and Advice	131
Recent Patents, Trade Marks, and New Companies	132

Published by Leonard Hill Limited, 17, Stratford Place, London, W.1. Mayfair 7383.

Subscription Rates: 1 year $5; 3 years $10; paid in advance

GELATINES

A bright sparkling jelly can only be made from a Gelatine of good strength, clarity and colour. All our grades are tested strictly according to the methods of the British Standards Institution and standardised to a definite specification.

Our Gelatines are also submitted to the most exacting laboratory tests to ensure complete freedom from harmful impurities.

OURY, MILLAR & CO LTD.
THAMES HOUSE, QUEEN STREET PLACE, LONDON, E.C.4.

THIS NAMEPLATE is affixed to every piece of stainless steel plant that leaves the Newman works. It is a symbol of good design, good workmanship and complete satisfaction.

ARE YOU A GOOD MIXER?

We like good mixers, we have a number here in the workshops—in fact, we are constantly turning them out in Stainless Steel without a blemish.

The fabrication of Stainless Steel calls for engineers with years of experience in handling this wonder metal. Newman have these men, plus the plant and the facilities, and are regularly fabricating complete Stainless Steel installations for some of the biggest names in the Brewing, Food and Chemical Industries.

Put your Stainless Steel problem up to Newman technicians.

Battery of Newman Stainless Steel Mixers delivered to Messrs. Lever Bros., Liverpool.

NEWMAN INDUSTRIES LIMITED

Yate, Bristol, England. Tel. Chipping Sodbury 3311.

FOOD MANUFACTURE

Vol. XXVI, No. 3 March 1, 1951

The Meat Situation

THERE is little that can be added to the meat controversy at the time of this writing when the vote of censure by the Opposition has been defeated by a majority of eight.

The reduction of the meat ration has brought forth bitter protests not only from the public in general but also from the medical profession, whose prognosis of protein insufficiency is dire.

Arguments on bulk buying, subsidies, and political and diplomatic implications have been tossed to and fro, but this is not the place to analyse them. From the mass of verbiage heard in the House of Commons, the fact emerges that any alleviation of the meat shortage will be a "long-term business." In the meantime, ridiculously small quantities of reindeer meat, goat meat, and even beef (the latter at a prohibitive price from France and then classified only as manufacturing meat) are being offered as a sop to the public.

A suggestion that has not gained much publicity is that put forward by Mr. J. K. Knowles, general secretary of the National Farmers' Union, that we improve our hill and marginal lands, thereby adding from one-third to half as much again to our supplies of beef and mutton. He deplores the long and progressive neglect of these lands, prompted by what he terms the bargain-basement mentality of the so-called cheap food policy pre-war, and to which he ascribes the miserable size of the present meat ration, and perhaps the need to have meat rationing at all.

Here again the policy advocated is a long-term one and has its obvious problems, but it should be examined, with all other alternatives.

Catering Hygiene

The Working Party set up by the Ministry of Food to study hygiene in catering establishments has now published its report. As in other post-war reports of a similar kind, the experts have not reached general agreement, and one of the divergences of opinion has an interesting bearing upon earlier regulations affecting ice cream businesses.

A majority of twelve members recommends that all catering establishments should require to be registered with the local authority, and that the authority should have the power to refuse registration when new premises do not seem to fulfil a required standard of hygienic conditions. In making this point the section of the 1938 Food and Drugs Act, which covers the case of premises making or selling ice cream, is quoted as a model example to be followed.

On this question, however, a minority recommendation signed by eight members of the Party considers new traders to have the right to be automatically registered on notifying the local authority of their intention to open a catering establishment. Several reasons are given for this view. Firstly, a person has a right to engage in a lawful business—it is a function of his personal liberty. Secondly, a trader must be protected against the possibility that local interests at a parochial level may determine whether he shall open a business or not. Thirdly, the hygiene of a catering establishment is at least as dependent upon how it is run as upon its plans and layout, and power should not be given to officials to prevent a trader from opening a catering business simply upon assumptions that the premises could not be hygienically conducted. Fourthly, after the registered business has been opened, the local authority has the power to see that the new business must be subject to the same local controls as other existing catering businesses. Should it not fulfil legal requirements of this kind, then the local authority should have the power to withdraw the registration.

This minority opinion is exceedingly practical and interesting. Should the Report be debated in the House, the eight-votes view may well attract more support than the twelve-votes view. It is certainly an issue that the ice cream trade should watch closely; for every point made in this cogent minority recommendation is a criticism of the present regulations for the registration of new ice cream premises.

In particular, the argument that hygiene depends upon the actual running of a business as much as upon layout is a powerful one. Can premises, unless they are obviously dirty, be prejudged for their hygienic standards? Conversely, suitable premises can become unhygienic through inefficient operation once they have been opened.

Chemicals in Food

The addition of chemicals to foods is occupying the attention of scientists in the principal food-producing countries. A Congressional committee composed of seven members of the House of Representatives, with James J. Delaney as chairman, is studying the effect of chemicals and synthetics upon the welfare of the nation and the well-being of agricultural economy, and will make recommendations for legislation if it concludes that such action would be advisable.

The committee is concerned primarily with the question of toxicity of the so-called bread softeners or emulsifiers about which there is a marked difference of opinion, and is attempting to determine a logical and just procedure which could be followed in deciding the question.

At a meeting in Chicago last November, Dr. Roy C. Newton, in testifying before the committee, asserted that, in his opinion, any food processor bears a moral obligation not to change the food supply by the addition of chemicals or by chemical processing until he has adequate scientific studies by competent scientists proving the non-poisonous character of a proposed process or addition. He declared that: "It is in the public interest to provide in any revisions of the Food and Drug Law a clear and decisive statement of the requirements necessary to secure approval for the use of such chemical substances." He made the important point that the wording of the law should be such as to protect the consuming public first, but also to protect the food producer and processor against arbitrary rulings of an Administrator who may be unscientific and unsound from a practical standpoint and against the public interest. The law should be clear on both points, so that while it protects the public, it should also be clear in its provision to prevent an arbitrary and unsound ruling from impeding progress.

Dr. Clive M. McCay, Cornell University nutritionist, was very emphatic on the necessity of long preliminary testing (he put it at ten years or more) before any chemical is ever added to a foodstuff. Dr. William B. Bradley of the American Institute of Baking, Chicago, stated that evidence of function and a request for permission to use a particular chemical in a food should come from some group that would represent the producer or processor, and should not come from the chemical manufacturer. It was the processor who was in the best position to determine whether it had usefulness.

Bearing upon this question is the use of higher alkyl gallates as antioxidants in fats, which is discussed in an article in this issue. Whether the data given are sufficiently comprehensive and whether the experiments have been carried on over a sufficiently long time is a matter for food scientists to decide. Regarding their use in Great Britain, the position is somewhat obscure as, although there is no specific legislation against this, it is quite possible that these and other antioxidants might well come within the meaning of a preservative as defined in the Public Health (Preservatives, etc., in Food) Regulations.

The use of antioxidants, anti-staling agents, and anti-mould, stabilising, and emulsifying agents is now being studied by a Sub-Committee of the Food Standards Committee appointed in January 1948 by the Ministry of Food. According to the terms of reference, its work will be comprehensive, and the views of research associations, food processing firms, and medical and technical associations will be invited, both as regards the interpretation and the limitations of the present Regulations.

This intensive work, both in Great Britain and in the United States, should, in time, clarify the indefinite position produced by the increasing use of chemicals in food.

Canned Foods and the Defence Programme

"Canned foods are essential to the defence programme, essential to the armies in the field, and essential to the civilian population at home." With these words, Mr. Carlos Campbell, executive secretary of the National Canners' Association, rammed home to members of the Tri-State Packers' Association, at their annual convention, that canned foods were a vital offensive and defensive weapon in modern war, and that the sooner this was realised by Government control agencies, the better it would be for all.

The terrors of attack by atomic bomb were graphically described by Mr. Campbell with the object of pointing out that in such circumstances there could be only one source of food available—the contents of a can—as the deadly rays that emanate from the atomic bomb will not penetrate the tin container, its contents thus being immune from radioactivity.

It was strongly urged at this convention that high priority should be granted for the metals and materials used in the manufacture of canning machinery.

In view of the present almost desperate situation of tinplate supplies and the resultant closing down of many canning factories, could not the same impassioned appeal be made to the British Government? The same fearful prognostications apply with equal force in Great Britain and, without being unduly pessimistic, we feel that similar action should be considered in the light of possible future events, quite apart from the need for something to be done to ameliorate the present predicament of the canning industry.

White Fish Legislation

The Sea Fish Industry Bill has already received its share of condemnation. Its main purpose is "to set up and give statutory powers to a White Fish Authority to reorganise, develop, and regulate the white fish industry in Great Britain. The Authority are required, among other things, to have regard to the interests of consumers in a plentiful supply of white fish at reasonable prices."

The powers which the Bill proposes to give the Authority include among others the right to carry on research and experiment, to encourage co-operation in the industry, to promote exports, to provide processing plants, and to give assistance for the provision of fishing vessels or processing plants. This assistance may take the form of purchase of shares. The Authority may make regulations dealing with the handling of white fish, subject to Ministerial confirmation and annulment by Parliament. Provision is also made for conferring additional powers on the Authority by means of statutory schemes. The Authority are also enabled to license fishing vessels engaged in catching white fish. Licences granted may be revoked only by the Court, and the Authority will not be able to refuse a licence unless the applicant has already proved himself unsuitable.

During its second reading in the House of Commons, the Bill, which is a long and complex one, was hotly contested. The general opinion of those who opposed it was that it was badly constructed and vague, but there was a large measure of unanimity about its necessity.

Whether there will be more fish or less fish; whether it will be dearer or cheaper; whether controls are good or bad; whether a complicated system of inspection is practicable; whether the proposals are an attempt at nationalisation by the back door—all these are arguments the resolution of which must be awaited by the long-suffering consumers who, except for the more articulate, are driven to murmur "Kismet" as food news reaches them.

Ireland and the British Larder

Ireland's exports of food to Britain in 1950 showed a considerable increase over the 1949 figures. While part of this increase must be regarded as a reflection of rising prices, the actual increase in quantity was substantial for certain foods. The imports of live animals, fresh and canned meat, and dead poultry all increased, and their total value rose from just over £28 million in 1949 to nearly £33 million in 1950. In this group the most impressive rise was for canned meat, which increased by 40 per cent. and would have increased still more but for the shortage of tinplate.

Another notable increase was shown by cocoa preparations. Imports from Ireland were valued at £1,804,534 in 1949, and £3,006,736 in 1950. Miscellaneous food products, including fish, fats, honey, biscuits, and preserved fruits, jumped from £2 million to more than £5 million. By contrast, however, imports of dairy produce declined considerably, an obvious consequence of Britain's greatly improved milk production. Cheese and condensed milk imports dropped sharply, and dried milk powder alone showed an increase, although even this was small. Eggs, fresh fruit, and vegetable imports also declined.

These figures seem to support the view that genuine Anglo-Irish co-operation could lead to the development of Ireland as an important food-producing neighbour. Despite changes in British food needs as a result of improvements in agricultural production, Ireland has been able to expand her food trade with Britain, increasing the value of the foods that Britain vitally needs and more than offsetting the decline in dairy product and egg requirements.

This flexible and far from small contribution to our food problem must surely be encouraged to the full. Ireland's own food crisis of just over a century ago intensified the rift between the two countries; a steadily expanding trade in food might well do more to heal the deap-seated wounds of history than all the efforts of politicians.

Consumer Taste

In view of the enormous trouble which is being taken by food manufacturers and research establishments to maintain tasting panels, we were intrigued by a little series of experiments which was carried out at a Press conference held in connexion with the opening of Wall's new catering laboratories.

Five members of the party, two men and three women, were given ice cream, the flavour of which they were required to identify. In order to eliminate any predilections which might be produced by the appearance of the products, these were all similarly coloured with a blue tint. The results were remarkable. In the first test three people returned the flavour as vanilla, one as pistachio, and one as ginger. The flavour was in fact ginger. Another test was with vanilla-flavoured ice cream, which one person returned as blackcurrant!

Saltiness in foods is another flavour to which different consumers exhibit widely varying reactions. Ofttimes, from half-a-dozen tasters three will pronounce a product containing (say) 3 per cent. of salt "too salty," while the other three will say "not salty enough."

These divergencies appear to be independent of the sex or age of the subjects. It is evident that there is no happy medium in the matter of taste, and that to some extent it is a "hit or miss" business for the manufacturer of flavoured foods.

Technical Collaboration with U.S.A.

The best way of getting to know what the other man is doing and what he wants is by personal contact. Adopting this way of thinking, Great Britain has, within the last two years, sent thirty-three teams of specialists to the United States, with the result that, according to one of the eighteen reports issued by the Anglo-American Council on Productivity, British production during the first half of 1950 increased between 6 and 9 per cent. above the comparable period in 1949, and is speedily growing.

Since the beginning of the Economic Co-operation Administration's technical assistance programme in January 1949, some 2,749 European specialists have visited the United States to study American industrial methods. Ninety-two teams of specialists were in the United States at the end of November 1950; an additional 255 teams of some 2,000 Europeans will go to America in the next few months.

British producers of food and food products should obtain valuable first-hand information on what new food products might find a ready market in the United States from Mr. George W. Foster, an American trade adviser on speciality foods, who will be in the U.K. this month, according to an announcement by the Economic Co-operation Administration Mission to the United Kingdom. From March 1 to 12 he will be available to give information on the United States food market, on consumer habits and tastes, and on Food and Drug Act regulations.

The intention is not to give instruction in production in any of the food plants, but solely to give exporters and potential exporters information on the U.S. market.

The British Dollar Exports Board has invited Mr. Foster to take part in the Dollar Convention to be held at Eàstbourne from March 1 to 3; appointments are also being arranged for him to meet some of the leading trade associations and companies in the food field.

A number of European countries have recently expressed interest in increasing their volume of food exports to the dollar areas. In 1950, approximately 15 per cent. of the combined total of exports from the ERP countries consisted of food and food products.

Burial of a Honeybee

The cult (if it may be so called) of the bee is of long standing. Nineteen hundred years ago, Martial, in one of his Epigrams, wrote of a bee which had become entombed in amber: "It has obtained a worthy reward for its great toils; we may suppose that the bee itself would have desired such a death." Through the generations the apotheosis of this insect has continued in poesy and prose. To countless infant minds it has been set up as an example of industry and a warning against idleness by the estimable Dr. Watts . . . in short, why a fuss about a specimen of this paragon of insects which found a tomb in a sausage?

Not long ago, a lady living in Southport bought half a pound of beef sausages. The same day she cooked them and put them in a lidded casserole in the larder, and the next day served them with roast duckling. Her husband had eaten half a sausage when he found an insect in it, and he and his wife were promptly sick. When the sausage was sent for analysis, the insect was identified as a honeybee. The legal gentleman who held a watching brief for the manufacturers is reported as saying: "Are you getting what you order if you find a honeybee, a comparatively innocent insect, in the sausage? Had it been a cockroach, it might have been different."

The time-honoured status of the bee remained firm; the summonses against the manufacturer and distributor for having sold a sausage which was not of the substance or quality demanded by the purchaser were dismissed.

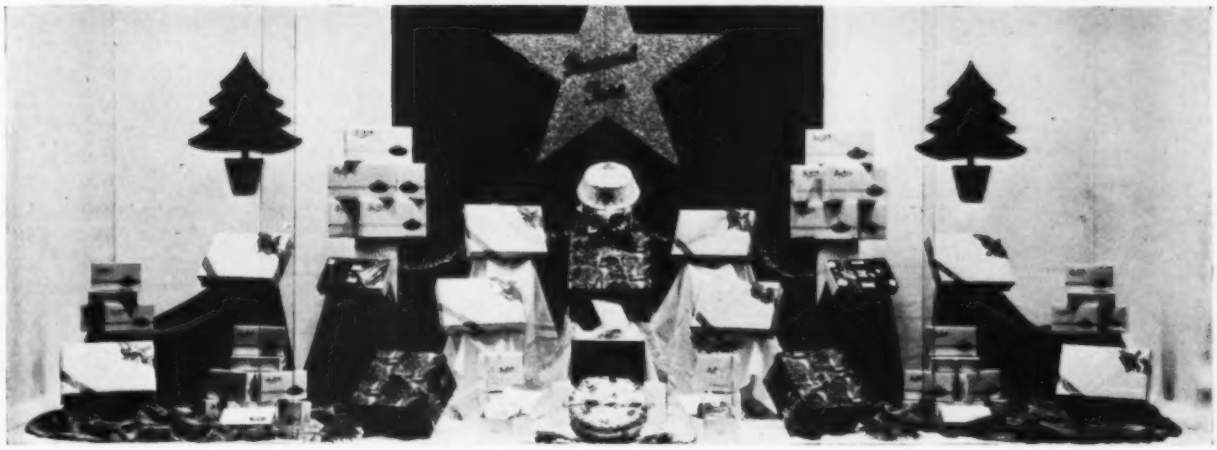
Alexis Soyer

Among the active *restaurateurs* of 1851 none merited more recognition than Alexis Benoît Soyer, who opened Gore House, Kensington, as a restaurant in the hope that the Exhibition would bring him many customers. His hopes at first were fully realised, but later the service provided by official caterers did better.

Although Soyer ultimately lost round about £7,000, the set-back was but a temporary one, and brought some publicity in its wake. For this Frenchman, born in 1809 in a village on the Marne, should be acknowledged as a pioneer in army and hospital catering. He had been chief cook on the *Boulevard des Italiens*, had cooked for the Duke of Cambridge, and became chef to the Reform Club, all of little avail as regards making a name at the time.

In 1847 he went to Dublin during an Irish famine to open his "economy kitchens" from which he dispensed rations of soup and meat at half the normal price. Two years later he was exhibiting "Soyer's magic stove," a small affair for cooking at the table. All of which stood him in good stead when, after 1851, he wrote to *The Times* offering to cook for the British army in the Crimean campaign.

The names of Florence Nightingale and Alexis Soyer might well be coupled, if due recognition is given to hospital well-being. Balaclava has perpetuated a helmet; but nothing remains to remind us of Soyer soup. The author of a *History of Food in All Ages* and of *Soyer's Charitable Cookery or The Poor Man's Regenerator* seems to have been forgotten whenever Army cookhouses or hospital catering are discussed.



Display of Fuller's packs for the confectionery industry.

The Confectionery Industry

Progress in 1950

R. L. KENNY, B.Sc., F.R.I.C.

While it is disappointing to record that the industry still operates under a scheme of rationing and price controls, and is likely to do so for some time to come, nevertheless some progress has been made during the year under review, particularly in relation to the decontrol of cocoa and cocoa butter.

SUGAR has remained in extremely short supply, and is now the controlling factor in confectionery output. As a countermeasure manufacturers have been able to obtain, under open general licence, processed ingredients from abroad, such as fondant and chocolate couverture, which have enabled them to increase their production capacity.

Sugar Purchases

Criticism has been levelled against a state of affairs which permits soft currency countries to purchase sugar from dollar sources and then to convert it into partly processed goods for sale in sterling to the British manufacturers, who are thereby paying a premium for the additional raw materials which they acquire.

Since price control still operates on all confectionery, unless it is prepared entirely from raw materials purchased through these sources, very careful thought has to be exercised in blending recipes to accommodate such materials and at the same time ensuring that a profit margin still remains.

These partially manufactured imported products have introduced special problems in their use. For example, quantities of sweetened cocoa butter containing as little as 5 per cent. of sugar have been available from Holland. The sugar particle size, however, sometimes averaged over eighty microns, which was considerably above the maximum generally accepted in a well-refined chocolate. It was, therefore, necessary to add this cocoa butter during the melangeur process, so that it ultimately passed through the refining stage. Any additional cocoa butter required to be added in the conche had to be derived from the material allocated by the Ministry.

Some continental cocoa butter tended to exhibit a stronger flavour, and care was, therefore, necessary when it was used in the preparation of milk chocolate, where the proportion of cocoa butter to cocoa solids is far greater than in the plain variety; otherwise there was a tendency for the flavour to strike a false note.

A considerable amount of Dutch apple syrup has also been brought into the country. Naturally British manufacturers of glucose who were still permitted to manufacture only an allocation based upon pre-war usage have been greatly disturbed by this trend, in so far as they had ample capacity for producing more glucose at a cheaper price, but were not able to obtain the supply of grain to do so. The system whereby apple juice was added to glucose in order to bring it into a different classification for importation into Great Britain was considered by the confectionery industry to be illogical and by the glucose manufacturers to be prejudicial to their business.

Syrup Imports

As a result of repeated representations, the Board of Trade has now prohibited the importation of all syrups containing more than 66 per cent. of glucose, and at the same time arrangements have been made for the manufacture of an apple syrup by British

Boiled sweets in heat-sealed Pliofilm bags do not stick together and can therefore be packed in light cardboard containers.

glucose manufacturers utilising material other than maize starch.

The industry, however, is of the opinion that glucose itself could be completely derationed in view of the fact that starch is now being offered up to 100 per cent. of entitlement, but the Ministry still maintains that glucose is not available in sufficient quantities to permit complete freedom, although a compromise has been reached by the provision of an increased allocation from 50 to 60 per cent. of basic entitlement.

In the meantime all additional supplies which manufacturers may need are taken up in the form of apple syrup.

Price Concession

There is no doubt that these imported materials, manufactured to a specification, have been of considerable assistance in maintaining output at a higher level, but the premium which must be paid is a heavy drain on financial resources, particularly as no price increase can be obtained for goods containing a proportion of these ingredients.

A concession in this direction has been made by the introduction of price freedom for all goods wholly manufactured from imported raw materials, although points must still be given up by the public when purchasing this type of confectionery.

As there are very few quality products which can be made entirely on this basis, there is now very little confectionery which comes into this category.

A great deal of embarrassment was originally caused by the sale, off points, of imported sugar confectionery, and the Ministry was forced to review the whole situation, otherwise the rationing structure would have been in danger of breaking down.

The Cocoa Situation

Perhaps the most disturbing feature of the cocoa position is the steady rise in its price, which has necessitated increased retail selling prices for chocolate assortments and moulded lines.

At the same time the price of sugar has remained almost static at a considerably lower level, and retail selling prices of sugar confectionery have actually been reduced by cutting both retail trade margins and the margin of profit to the manufacturer. The danger which lies ahead is that consumer resistance might be created against the purchase of goods containing a high proportion of cocoa in favour of sugar confectionery.

One of the most interesting developments was the decision of the Ministry to pass back to the trade as from November 1, 1950, the responsibility for the future purchase of cocoa. This withdrawal of control was a step welcomed by all, but the main initial problem which it was anticipated would arise was that the price of cocoa and consequently that of cocoa butter on a completely free market would fluctuate to a considerable extent.

Bearing in mind that the Ministry was adamant that price control should still operate on retail sales, the industry has suggested a scheme, in which the majority of manufacturers has agreed to co-operate, whereby a panel of experts nominated by the members will undertake the negotiations to purchase 75 per cent. of the cocoa required. It is only intended that this scheme should operate for a period of twelve months, in order to safeguard the manufacturers against having to pay varying prices for cocoa, and yet be forced to market their goods at a fixed maximum selling price. This arrangement will give everyone the opportunity of purchasing the remaining 25 per cent. of cocoa requirements on a completely unrestricted basis.

Packaging Problems

The confectionery industry, in common with other industries, has had to face packaging problems which have arisen out of a deterioration in the paper and board situation.

Practically every form of packaging material is now in short supply, and it is unfortunate that this dearth should coincide with the granting to the industry, after lengthy negotiation, of special packaging allowances for the marketing of confectionery in rigid boxes. Nevertheless, in spite of the difficulties, this concession permitted the preparation of specialised Christmas ranges for gift purposes.

In view of the fact that so many other allied industries were decontrolled on packaging costs, it was

most important that the confectionery industry should come into line so that it might offer increased presentation, and thus keep before the public a high standard of acceptability.

Packs for Chocolates

There are factors which may tend to retard the sale of this type of merchandise, and these will have to be taken into account before it is possible to assess the popularity of 1 lb. and 2 lb. boxes of Chocolate Assortments. For instance, a ration of only 5 oz. per week makes the purchase of a larger unit slightly more difficult than that of confectionery in loose form. In the second place, the additional packaging allowance added to the price of a pound unit of chocolates is liable to set up a consumer price resistance. Nevertheless, the trade welcomes these concessions as a definite step towards the re-establishment of pre-war trading practice.

Effects of Tinplate Shortage

The shortage of tinplate has inevitably resulted in the continuance of the regulation that the minimum pack available to the home market prepared with this material shall be 7 lb. As a result loose sales of all types of sugar confectionery have been the most widely utilised form of marketing; this has resulted in an increasing tendency towards the development of high-speed wrapping machines which will wrap individual units in transparent film or waxed paper carrying attractive designs. In view of the present labour situation, every possible method has been investigated of eliminating manual processes which at one time were considered to be part and parcel of the sugar confectionery industry.

How far such a trend will ultimately affect the usually accepted conception of the packaging of Chocolate Assortments is as yet unknown. This followed a definite pattern in which attractive rigid boxes packed with chocolates in individual cups, tied and decorated with satin ribbon, were the usual method of presentation when labour costs bore a practical relationship to that of the raw material, but it may well be that other ideas will now have to be introduced whereby the acceptability of the chocolates is maintained as much as possible but packaging costs are reduced to a minimum.

There is already a growing tendency among some manufacturers to ignore the hand piping and decoration of Assortments, and to twist-wrap these in wrappers which incorporate a design and also indicate the type of centre of which the chocolate is composed. It is perhaps difficult to forecast the trend of public reaction because insufficient statistical data have yet been collated since the return of rigid boxes, for it is upon these larger and more attractive units that judgment will ultimately have to be passed.

Export Prospects

The export market has undoubtedly flourished as a result of the co-operation of the industry, but the future outlook is a little more obscure in view of the fact that the Ministry has until now subsidised the price of cocoa beans. As a result of the decontrol of cocoa in the latter part of the year, the subsidy will now cease, and manufacturers will have to re-cost all export lines based upon a world market price for cocoa.

Other incentives undoubtedly will be devised in order to maintain interest in this sphere, but there is every indication that competition against producers in overseas countries will now increase. This should have little effect on sugar confectionery, which forms a considerable proportion of the export potentialities, and there is every reason to suppose that success in this sphere will continue.

Considerable progress has been made on the overall printing of tinplate in a variety of multi-coloured designs, which have certainly proved that the suppliers are well behind the industry in fostering this drive.

Susceptibility to Climate

Export presents a problem to the chocolate manufacturer in that his goods are particularly susceptible to extreme climatic conditions, either as a result of excessive humidity or heat. There is a tendency for Fondant Creams to harden and dry out because the couverture itself becomes somewhat porous, and the incidence of fat bloom results in loss of presentation. It is necessary to prepare special centres containing a higher proportion of hygroscopic ingredients, in order to reduce the relative vapour pressure of the fondant. This is usually accomplished by the addition of an enzyme which, under controlled conditions, gives a delayed action inversion of cane sugar, thus enabling the creams to be firm enough for the initial starch casting and

The pack for Meltis New Berry Fruits, which has been designed by Richard Lonsdale-Hands, is printed in two colours on a Pearlite box and is wrapped and sealed in transparent cellulose.

New pack for Batger's Chinese Figs.

mogul processes and yet allowing sufficient inversion over a period for the production of soft cream centres by the time the goods have reached the consumer overseas.

Flavours and Essences

All the essential oils have now been removed from control, and while this has caused considerable price fluctuation, particularly in the case of the citrus oils from Sicily, the position would now appear to have become more stable. The main advantage arising out of freedom from control is that the forward position has become easier and stocks can be maintained at lower levels. This is a very important quality aspect with oils such as orange which are susceptible to oxidation.

Essential oils obtained from farther afield, as, for example, West Indian distilled lime oils, are still in short supply, and the price has been continually marked upward. Supplies of oil from dollar sources have been practically non-existent, and manufacturers have had to rely on purchases of Wayne County type American peppermint oil from European countries who have bought in dollars and re-exported in sterling at a premium.

The high price of dutiable alcohol has tended to reduce the amount of pure spirit essence which is utilised, and essence distillers have experimented with non-dutiable solvents.

In the case of essences for high-boiled goods, diacetin and triacetin have been successfully employed as diluents for blended essential oils, and the non-volatile nature of these two solvents conveys to the essence certain fixative properties which reduce evaporation losses when the essential oil is added.

Incorporation of Acid and Flavour

One of the great difficulties encountered in the preparation of boiled sweets is the incorporation of acid and flavour. Most large manufacturers of sugar confectionery now employ a vacuum process for the production of the sugar syrup, but in order to utilise the flavour to the best possible advantage it is still necessary to fold this into the batch on a slab, together with acid in powder form. This tends to produce unevenness of concentration throughout the batch and the development of air bubbles. When, therefore, a highly concentrated oil such as peppermint, which is completely immiscible with sugar syrup, is utilised, the tendency for the development of oil pockets throughout the batch can be very great unless extreme care is taken with the addition, and it is for this type of oil that dilution with a non-volatile solvent is particularly applicable.

Repercussions of Rationing

One of the principal repercussions of rationing is that the public may gradually become accustomed to purchasing other types of foodstuff containing high proportions of sweetening matter, in order to make up a sugar deficiency. This has produced a feeling in the industry that a very unfair position has arisen in that allied trades utilising sugar as a basic ingredient, *e.g.* preserve and cake and biscuit manufacture, are free to sell to any individual purchaser any quantity of material which he cares to buy.

These industries are also controlled as far as their allocation of raw materials is concerned, but the ability of the public to carry out free purchases is the main bone of contention. Apart from these well-known household types of commodity, there are also plenty of ancillary foodstuffs on the market competing without control for the ever-dwindling amount of money which is available.

Consumer Demand not Met

It is considered in the light of previous experience that control cannot end until the ration can equal the pre-war consumption level of between 7 and 8 oz. per person per week, but it is quite possible that if rationing is continued into the distant future, then the public appetite for chocolate and sugar confectionery might be diverted to other products, to the detriment of the industry.

There is every reason, therefore, to press for derationing at the earliest possible opportunity, but in view of the fact that points redemption, while falling slightly, is still at a very high level, there is every indication that the present ration is a long way from meeting the existing demand.

Future of Rationing

It is hoped that the ration will be increased in stages until such time as the proportion of points exchanged for goods falls to a lower level. This will involve the release of additional sugar, whereas the industry has recently received a further reduction in the

(*Concluded on page* 113)

FAO and National Nutrition

In the foreword to his report of the work of FAO in 1949/50, Professor N. E. Dodd, the director-general, traces the progress of the organisation during the five years since it was established at Quebec on October 16, 1945.

In the broadest sense, the work during these years has been directed towards bringing about far better use and management of the resources of that thin layer of soil and sea which in the last analysis is the source of all material wealth and on which the whole livelihood of man depends. The objective in its simplest terms is to enable millions to be better fed, clothed, and housed.

The Work of FAO

In the course of his review, Professor Dodd enumerates fifty landmarks in the work of FAO; this list covers a wide field and comprises important steps in the achievement of its objectives. The fiftieth and last item entitled "Development of world food conscience" is probably the most outstanding. Perhaps the most important work of FAO has been to help develop a world consciousness of the crucial nature of the food problem and what can be done about it—a world conscience that is increasingly demanding adequate action.

Assistance for the Nutritionists

With regard to nutrition, everything that FAO does in this field is related to the fundamental task of encouraging and enabling governments to adopt the principle of basing their food policies and programmes on the needs of their people.

The work has consisted essentially of providing assistance for technical workers in nutrition through the following activities:

1. *Providing basic tools.*—In planning fully effective national food production and distribution programmes, it is necessary to know as much as possible about the nutrient content of available food supplies and also what representative groups of the population are actually consuming. It is also necessary to know what the physiological requirements for calories and nutrients of population groups are, and what these requirements mean when translated into terms of the foods that will supply them and that can be readily produced and imported. To date FAO has issued three publications which will enable member governments to obtain such information: *Calorie Requirements: Report of the Committee on Calorie Requirements; Food Composition Tables for International Use;* and *Dietary Surveys: Their Technique and Interpretation.*

2. *Encouraging the use of effective social devices for improving the nutrition of people.*—Two of the most important social devices are supplementary feeding programmes (for infants, children, expectant and nursing mothers, and industrial workers) and widespread education about foods and nutrition. Work is in progress on a study of successful school feeding programmes in various countries, which will be published as a guide to governments, and a handbook on nutrition education, *Teaching Better Nutrition: A Study of Approaches and Techniques,* is to be issued soon. Much direct consultation in these fields has also been carried on with governments.

3. *Developing awareness of nutrition problems and programmes.*—Contacts with nutrition workers have been broadened considerably during the past year through regional nutrition meetings (the Far East and Latin America), technical committees (the Calorie Requirements Committee), and visits to various countries by regional nutrition representatives, nutrition officers from headquarters, and the Director of the Nutrition Division. Such contacts help to stimulate member governments to develop programmes along satisfactory lines. Also they often help to strengthen the position of nutrition workers in their own countries and with their governments. They provide FAO with more information on food and nutrition problems, enabling better direction to be given to the planning of future activities.

4. *Direct aid to governments in establishing and carrying out nutrition programmes.* — Though financial limitations have in general made it impossible to assign staff members for lengthy periods to one country, a three-year assignment will be completed in Greece, where an FAO nutrition worker has been assisting the government in formulating and starting a broad nutrition programme; a similar assignment will be carried out in Turkey in the near future. Another FAO nutrition officer has been assigned for similar work in Thailand during the latter half of 1950. Earlier in the year, officers of FAO and WHO visited Egypt and gave advice on the nutrition policy and programme of that country.

5. *Co-operation with other international organisations.*—There has been effective collaboration with WHO on a number of projects. In Guatemala the organisation is working closely with the Institute of Nutrition for Central America and Panama and with the United Nations International Children's Emergency Fund. Much attention has been given during the year to the problem of international action to meet the continuing needs of children, discussed by the Economic and Social Council in August 1950.

The past year's experience has emphasised three needs which will affect activities in the future: the need for more practical nutrition work in the field; the need for the training of nutrition workers, through fellowships, regional training centres, or any other practicable means; and the need for providing more assistance in developing nutrition services.

FUTURE ARTICLES

ARTICLES appearing in future issues will include *The Vitamins,* by F. A. Robinson, M.Sc.(Tech.), LL.B., F.R.I.C.; *Fluorescent Tracer Agents,* by J. A. Radley, M.Sc.(Lond.), F.R.I.C.; *Progress in the Baking Industry,* by S. Walter Butterworth, B.Sc. (Tech.), F.R.I.C.

Ministry of Food

LATEST STATUTORY INSTRUMENTS

The list given below is the continuation of the list of Instruments published in "Food Manufacture," November 1, 1950, page 450.

No.	*Date 1950*	
		PRICE FIXATION
1693	Nov. 1.	Order amending the Milk (Control and Maximum Prices) Order, 1947.
1740	,, 5.	Order revoking the Imported Apples Order, 1948.
1741	,, 1.	Order revoking the Raw Cocoa (Control and Maximum Prices) Order, 1946.
1766	,, 5.	Order revoking the Soya Flour (Control and Maximum Prices) Order, 1946.
1799	,, 12.	Order revoking the Stockfeed Potatoes (Maximum Prices) Order, 1948.
1800	,, 12.	Order amending the Milk (Control and Maximum Prices) (Great Britain) Order, 1947.
		EGGS
1661	Oct. 15.	The Eggs (Great Britain) Order, 1950. Revokes S.I. 1949, Nos. 612 and 1748; S.I. 1950, Nos. 615, 709, 1076, 1205, and 1547.
1662	,, 15.	The Eggs (Northern Ireland) Order, 1950. Revokes S.I. 1949, Nos. 613 and 1749; S.I. 1950, Nos. 615, 709, 1076, 1205, and 1547.
1958	Dec. 10.	Order amending the Eggs (Great Britain) Order, 1950 and the Eggs (Northern Ireland) Order, 1950.
		FEEDINGSTUFFS
1988	Dec. 17.	The Feedingstuffs (Manufacture) Order, 1950. Revokes S.I. 1949, No. 1067, and 1950, No. 1540.
2018	,, 17.	Order amending the Feedingstuffs (Prices) Order, 1950.
		FLOUR CONFECTIONERY
1646	Nov. 26.	Order amending the Flour Confectionery (Control and Maximum Prices) Order, 1946.
		FOOD STANDARDS
1871	Nov. 29.	The Food Standards (Preserves) (Amendment) (Commencement) Order, 1950.
		HOME-GROWN GRAINS
	1951	
2048	Jan. 1.	Order amending the Wheat (Great Britain) Order, 1949 and the Wheat (Northern Ireland) Order, 1949.
2049	,, 1.	Order amending the Dredge Corn (Great Britain) Order, 1949 and the Dredge Corn (Northern Ireland) Order, 1949.

No.	*Date 1950*	
		LICENSING OF WHOLESALERS
1798	Nov. 12.	Order amending the Food (Licensing of Wholesalers) Order, 1949.
		MEALS IN ESTABLISHMENTS
1860	Dec. 18.	The Establishments (Christmas Turkeys) Order, 1950.
		MEAT
1764	Nov. 5.	Order amending the Meat Products and Canned Meat (Control and Maximum Prices) Order, 1948.
		POTATOES
1882	Dec. 1.	Order amending the Ware Potatoes Order, 1950.
1962	,, 13.	Order amending the Seed Potatoes Order, 1950.
2000	,, 13.	Order amending the Ware Potatoes Order, 1950.
		RATIONING
1660	Oct. 15.	Order amending the Meat (Rationing) Order, 1950.
1692	,, 22.	Order amending the Bacon (Rationing) Order, 1950.
1791	Nov. 9.	Order amending the Food Rationing (General Provisions) Order, 1950.
1918	,, 3.	The Christmas and New Year Food Directions, 1950.
1989	,, 17.	The Food Rationing (General Licence) Order, 1950.
	1951	
74	Jan. 28.	Order amending the Fats, Cheese, and Tea (Rationing) Order, 1950.
117	,, 28.	Order amending the Bacon (Rationing) Order, 1950.
159	Feb. 4.	Order amending the Meat (Rationing) Order, 1950.
		SOYA BEANS
	1950	
1765	Nov. 5.	Order revoking the Soya Beans (Control) Order, 1948.
		STARCH FOOD POWDERS
1907	Dec. 8.	Order revoking the Starch Food Powders (Control) Order, 1944.
		VITAMINS
1790	Nov. 9.	Order revoking the Vitamin A (Control) Order, 1941.

The Higher Alkyl Gallates as Antioxidants

K. J. H. VAN SLUIS

Edible oils and fats, as well as fat-containing food products, are subject to reactions which cause changes in their nutritive and/or organoleptic properties and may render the fats toxic to man. Much of the work on this subject carried out by the Central Institute for Nutrition Research, affiliated to the National Council for Applied Scientific Research in the Netherlands (T.N.O.), is devoted to combating the formation of oxidative reaction products by developing suitable antioxidants which will inhibit rancidity and also comply with public health requirements.

AN efficient antioxidant must fulfil the following requirements:

(*a*) Even in such low concentrations as 0·005 to 0·02 per cent. of dry material, it must protect all unsaturated components of oils or fats from oxidative changes.

(*b*) It must be proved to be non-toxic, even when continuously consumed in concentrations several times greater than the dose normally ingested.

(*c*) The organoleptic properties of the foods to which the antioxidant has been added must not be modified to any extent.

(*d*) It should be capable of production on a commercial scale at a cost that will not materially influence the cost of foods in which it is used.

These requirements appear to be fulfilled by NDGA (nordihydroguaiaretic acid), which is extensively used in America, while in Europe considerable interest is being evinced in some esters of gallic acid developed by the T.N.O. About twenty of these have been studied extensively, but only four of them, *i.e.* methyl, ethyl, octyl, and dodecyl gallates, have been selected for further investigation.

Synthesis of Higher Alkyl Gallates

Bivalent phenols with hydroxyl groups in *ortho* or *para* positions possess powerful antioxidative properties. These compounds, *e.g.* hydroquinone, are, however, not entirely harmless to man and also are almost insoluble in oils and fats. Prior to 1939, Sabalitschka and Böhm drew attention to the potentialities of the lower gallates as antioxidants. At that time, the synthesis of the higher alkyl gallates had not been achieved, but after the liberation of the Netherlands, successful methods for their synthesis were developed by the T.N.O. research workers. Two different procedures are the subject of Dutch patents, Nos. 63,319 and 66,611.

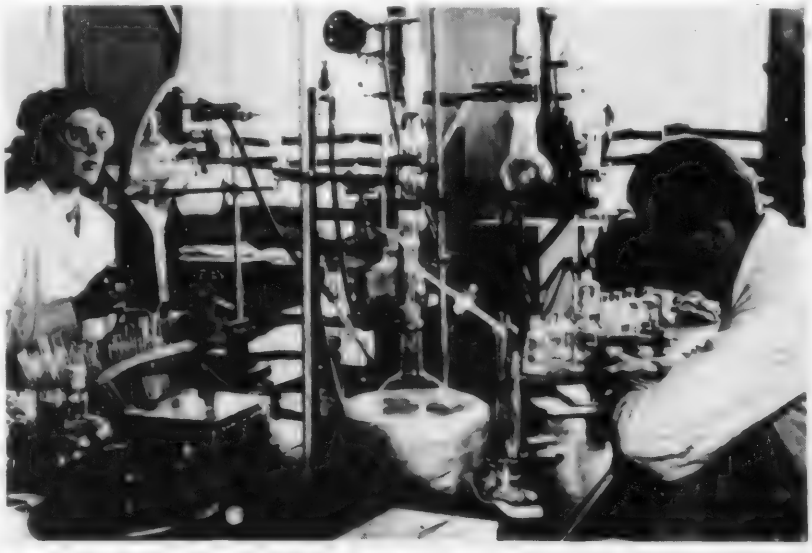
At the present time, octyl and dodecyl gallates are being produced commercially and supplied by Naarden Chemical Works, of Bussum. All Dutch research on higher alkyl gallates is centralised at the Institute for Nutrition Research, of Utrecht, and conducted by Mr. F. D. Tollenaar, Chem. Eng., whose team also discovered that these compounds are readily soluble in oils and fats, thus providing them with a more general protection from deterioration than do the lower gallates.

Toxicological Aspects

In America, the toxicological aspects of the gallates have been studied, with the result that propyl gallate has been authorised as an antioxidant in oils and fats intended for human consumption.

A number of research workers have reported that the lower alkyl gallates possess little toxicity. According to a recent publication, the LD_{50} of propyl gallate, used with albino rats, has been found to be about 3·8 g. per kilo. In testing rats over fourteen to twenty-four month periods, it was observed that they exhibited no toxic symptoms, even when they had been fed on diets containing propyl gallate in doses equivalent to at least one hundred times what would have been ingested if all dietary fats had been treated only with sufficient amounts of this antioxidant to prevent rancidity of the fats.

The Dutch research workers carried out a similar series of tests with rats to find out whether higher alkyl gallates would produce any injurious effect. All experiments revealed that high single doses of octyl, decyl, and/or dodecyl gallates are not toxic. The LD_{50} of the higher gallates appeared to be approximately 4 g. per kilo, whereas in continuous feeding tests when a diet containing 0·2 per cent. of dodecyl gallate in the fat fraction was given,



One of the laboratories of the Naarden Chemical Works.

no decrease in growth could be noticed, even after three successive generations of rats.

In the Netherlands the use of gallates (including higher alkyl gallates) is under consideration by Food Act officials. Also, the governments of other European countries may discontinue their objections to the use of higher alkyl gallates in food and food products, provided that their presence is declared on labels, etc.

It is the view of the Dutch research workers that chemically pure higher alkyl gallates are innocuous, and therefore can generally be accepted as stabilisers for fat-containing food products, as well as edible oils and fats.

Fungicidal Properties

Apart from their remarkably high antioxidant powers, some of the higher alkyl gallates possess fungicidal properties; whether they be classed as preservatives is a matter of interpretation.

Comparative figures are presented in Table 1, resulting from modified mycelium inhibition tests using *Fusarium avenaceum* as test species.

TABLE 1

Compounds	*Fungicidal properties expressed in o/oo of the activity of tetramethylthiuram disulphide*
Gallic acid	<1
Methyl gallate	<1
Ethyl gallate	<1
Propyl gallate	1·5
Isopropyl gallate	<1
Butyl gallate	3
Amyl gallate	8
Isoamyl gallate	<1
Hexyl gallate	64
Octyl gallate	250
Nonyl gallate	375
Decyl gallate	500
Dodecyl gallate	250
Cetyl gallate	3

Extensive investigations have been made in the Netherlands in connexion with the problems of acute toxicity of octyl gallate, as well as of chronic toxicity of methyl, octyl, and dodecyl gallates.

Acute Toxicity

To determine acute toxicity, 40 g. of octyl gallate were diluted with distilled water, to make 200 ml. of solution. The mixture was homogenised for one minute, by which time the volume of the homogenised mixture had been increased to 210 ml. and with the aid of a stomach tube was fed in portions of 5 to 10 ml. to thirty-five adult albino rats. The LD_{50} of octyl gallate in aqueous suspension was found to be approximately 4·5 g. per kilo, showing a fair comparison with the results obtained by Orten and others.

With Orten's tests the animals usually died within ten to sixty minutes after application, whereas in the Dutch tests this period has always been from one to fifteen days. Dissection revealed that the liver, kidney, and spleen had remarkable black discolorations. It was also found that octyl gallate in aqueous suspension or in alcoholic-aqueous solution caused some temporary loss of taste. This local anaesthetic effect has been further investigated under the direction of Prof. Dr. U. G. Bijlsma at the Pharmacological Laboratory of Utrecht State University.

Dissolved in groundnut oil, octyl gallate appeared to have some effect on rabbits' eyes, but certainly not on the motor nerve system demonstrated by the frog's muscle/nerve test. The gallate-in-oil solution did not produce any noticeable effect on the tongue.

Acute toxicities for octyl, decyl, and dodecyl gallates have been estimated accurately as follows: LD_{50} (rats) of octyl gallate is 4·7 g. per kilo; LD_{50} of dodecyl gallate is about 6·5 g. per kilo. Rats used in these latter estimations numbered 48 dosed with dodecyl and 57 dosed with octyl gallates.

Chronic Toxicity

To determine the chronic toxicity of methyl, octyl, and dodecyl gallates rats were fed *ad lib.* a diet consisting of:

	Parts
Whole wheat	57
Skim milk powder ...	29
Dried brewer's yeast ...	5
Refined hydrogenated coconut oil	7
Steenbock salt mixture, No. 40	2
Vitamin A-D concentrate	0·02

For chronic toxicity tests, gallates were added to the fat fraction in a concentration of 0·2 per cent. of the fat content. For each of the gallates, as well as for the corresponding control diets (without any trace of gallate) twelve female and twelve young male rats were the subjects of feeding tests. Experiments continued until female rats showed an average weight of 225 g. and male rats about 300 g. Weight response curves of the various test groups did not show any significant difference, as illustrated in Tables 2, 3, 4, 5, and 6.

TABLE 2

METHYL GALLATE

Test animals	*Average weight in grams after*		
	0 days	*40 days*	*70 days*
Control, female ..	54	140	177
Methyl gallate, female	55	145	177
Control, male ..	54	163	235
Methyl gallate, male	56	177	253

TABLE 3

OCTYL GALLATE

Test animals	*Average weight in grams after*		
	0 days	*40 days*	*70 days*
Control, female ..	56	149	190
Octyl gallate, female	50	144	178
Control, male ..	60	186	252
Octyl gallate, male	59	184	259

TABLE 4

DODECYL GALLATE

Test animals	*Average weight in grams after*		
	0 days	*40 days*	*70 days*
Control, female ..	54	140	177
Dodecyl gallate, female	53	142	175
Control, male ..	54	163	235
Dodecyl gallate, male	55	182	250

Rats of the dodecyl gallate-fed group, when six months old, were paired. Reproduction amounted to eighty from twelve female rats, this being a normal reproduction rate. From the youngsters four groups of test animals were formed, two of which were again fed diets containing dodecyl gallate, while the other two groups acted as controls.

Rats of this gallate-fed second

generation were paired, yielding a reproduction number of fifty-five from eight out of ten female rats that had been fed diets containing dodecyl gallate; and another reproduction number of eighty-seven from eleven out of twelve female rats that had been fed diets to which gallate had not been added. In both cases reproduction rates were normal.

From the youngsters of the second gallate-fed generation two new test groups and new control groups were formed.

Close observation of the rats of the third generation for four successive months did not reveal any abnormal development in growth or weight increase.

Mr. F. D. Tollenaar (second from left) handles a high-pressure container in one of the laboratories of the Central Institute for Nutrition Research.

Summary and Conclusions

Summarising, it may be concluded that with rats no harmful effects of methyl, octyl, and/or dodecyl gallates can be detected, provided chemically pure gallates that have been dissolved in the fat fraction of the diets are used. It must be emphasised that in all these tests rats were fed on diets containing a gallate concentration of two hundred times the normal dose. Assuming a test rat having an average weight of 100 g. consumes 10 g. of the test diet (containing 7 per cent. of fat), this means a daily consumption of 14 mg. of gallate. On the other hand, if a man having a weight of 11 stone consumes daily 50 g. of fat containing higher alkyl gallate in the concentration of 0·01 per cent., his daily consumption would amount to 0·07 mg. of gallate per kilo body weight only. The resulting safety coefficient of 200 must be considered sufficient to warrant a safe inclusion of higher alkyl gallates in edible oils and fats, as well as fat-containing food for human consumption.

Acknowledgment: The author wishes to express his sincere thanks to Dr. W. A. van Dorp Sr., scientific director of Naarden Chemical Works, Ltd., of Bussum, and to Mr. F. D. Tollenaar, Chem.Eng., in charge of the direction of gallate research at the Central Institute for Nutrition Research, T.N.O., of Utrecht, for their permission to use unpublished scientific data, and for their kind and expert help in providing him with appropriate material.

TABLE 5

DODECYL GALLATE (Second Generation)

Test animals	*Number of animals*	*Average weight in grams after*		
		0 days	*40 days*	*70 days*
Control, female	12	80	140	159
Dodecyl gallate, female ..	10	81	141	169
Control, male	11	95	177	222
Dodecyl gallate, male	12	91	151	208

TABLE 6

DODECYL GALLATE (Third Generation)

Test animals	*Number of animals*	*Average weight in grams after*		
		0 days	*40 days*	*70 days*
Control, female	11	50	134	172
Dodecyl gallate, female ..	12	52	142	179
Control, male	11	60	180	256
Dodecyl gallate, male	12	55	162	244

REFERENCES

Tollenaar, F. D., "Application of the Higher Esters of Gallic Acid in the Food Industry." Text of a lecture read by the author at a meeting at Copenhagen on September 14, 1949 (not in print).

Tollenaar, F. D., "Occurrence and Prevention of Oxidative Deterioration in Dairy Products." XIIth Intern. Dairy Congress, Stockholm, 1949, Vol. 2, Section II, pp. 357-67.

Tollenaar, F. D., "Gebruik en Toxiciteit van enkele Esters van Galluszuur." Research Report No. R.168, Central Institute for Nutrition Research, T.N.O. (1949) (confidential report).

Quackenbush, F. W., "Toxicity of Rancid Fats." *Oil and Soap*, **22**, 12, 336-8 (December, 1945).

ADDITIONAL LITERATURE

Ault, W. C., Weil, J. K., Nutting, G. C., and Cowan, J. C., "Direct Esterification of Gallic Acid with Higher Alcohols." *J.A.C.S.*, **69**, 2003-5 (1947).

Böhm, E., and Williams, R., "A Study of the Inhibiting Actions of Propyl Gallate (*n*-propyl-trihydroxy-benzoate) and certain other Trihydric Phenols on the Autoxidation of Animal and Vegetable Oils." *Quart. J. Pharm. Pharmacol.*, **16**, 232-43 (1943).

Hilditch, T. P., "Some Factors Affecting the Control of Oxidative Rancidity." *Chem. and Ind.*, 67-71 (1944).

Lea, C. H., "Rancidity in Edible Fats." Dept. Sci. Ind. Res. Food Investigation, Special Report No. 46 (1938).

Lundberg, W. O., "A Survey of Present Knowledge, Researches, and Practices in the U.S. concerning the Stabilisation of Fats." Hormel Inst. Univ. Minn., Publ., No. 20:45 (1947).

Morris, S. G., Kraekel, L. A., Hammer, D., Myers, J. S., and Riemenschneider, R. W., "Antioxidant Properties of the Fatty Alcohol Esters of Gallic Acid." *J.A.O.C.S.*, **24**, 309-11 (1947).

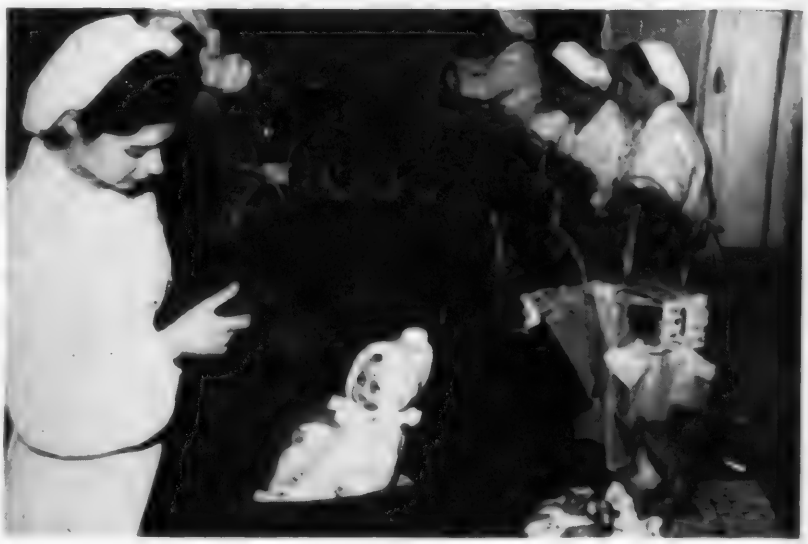
Orten, J. M., Kuyper, A. C., and Smith, A. H., "Studies on the Toxicity of Propyl Gallate and of Antioxidant Mixtures containing Propyl Gallate." *Food Tech.*, **2**, 308-16 (1948).

Easter Eggs

In Perugia, an ancient town in the centre of Italy, is situated the Perugina factory where sweetmeats of all kinds and more especially chocolate products are made for export or home consumption. The export trade of this firm is considerable; in some years it has amounted to 70 per cent. of the total exports for the whole of Italy in this branch of industry.

AT THIS time of the year the production of Easter eggs is in full swing at the Perugina factory. These are a speciality of the firm and one which has been continuously developed during the last forty years.

The chocolate used in the production of these eggs is semi-sweet and flavoured with vanilla. The mixing of liquefied chocolate at a constant temperature is carried out in large copper pans fitted with stirrers.



Moulding the Chocolate

Having acquired the desired consistency and aroma, the chocolate is poured into moulds, which are then placed in a cooling chamber for the first hardening, and after undergoing a preliminary polishing they are put in a freezing chamber. When completely solidified, each set of halves is ready to be formed into the finished egg.

Before the halves are joined by a simple heating process, a gift is inserted. This consists of a toy of some kind; in the case of the larger eggs, it may be an elaborately dressed doll or a Punchinello.

Top: **After a preliminary hardening and polish, the moulds are placed in a freezing chamber until the chocolate is solidified.**

Centre: **A dressed doll, or some other gift, is placed in the egg before sealing.**

Bottom: **A rose made from ribbon is used to decorate the finished egg.**

The finished egg is then adorned with many-coloured silk ribbons, tufts of Cellophane, or gilded bells tied with raffia, and set upon a support of polished metal. Much ingenuity is expended in decorating these eggs. One attractive decoration consists of a large rose made of silk ribbon; this idea emanated from one of the factory operatives, who fashions the rose from a single piece of material.

The finishing touch is the affixing of the gilt seal of the firm to the covering of the egg.

Sugared Chocolate Eggs

In addition to these speciality products, the Perugina factory manufactures small chocolate eggs covered with a layer of flavoured sugar. To apply this sugar coating, the eggs are placed in large circular rotating copper pans into which sugar syrup of the proper consistency is allowed to flow. The rotation of the pans ensures even distribution of the sugar on the surface of the eggs.

Other items of the factory's output consist of slab chocolate and chocolate drops which are automatically wrapped in tinfoil and decorated paper.

Novel Confectionery Packs

Packaging is carried out in various attractive ways. Novel two-purpose packs consist of *Mode de Paris* boxes, the lids of which comprise reproductions of old French prints in water-colours, framed in glass, that can subsequently be used to adorn the walls of the home, and "book boxes," bound in leather with gilt impressions, containing a selection of love lyrics in addition to chocolate drops!

Top: **Other eggs are decorated with tufts of Cellophane and on all of them is affixed the gilt seal of the firm.**

Centre: **Chocolate eggs, covered with a layer of flavoured sugar are another of the firm's products. The coating is applied by means of circular rotating copper pans into which sugar syrup is allowed to flow.**

Bottom: **Many novel two-purpose packs have been designed for the firm's products, including reproductions of French prints and "book boxes."**

Progress in Agricultural Research

THE first volume in a series dealing with agronomy was reviewed in the July, 1950, issue of FOOD MANUFACTURE. The same high standard of treatment has been maintained in the second volume,* but the proportion of subject matter likely to be of interest to agricultural scientists outside America, or at any rate in the British Isles, is somewhat lower.

The subjects surveyed in this latest volume are: Cotton, Soil Nitrogen, Vegetable Production, Prairie Soils of the Upper Mississippi Valley, Ladino Clover, The Control of Soil Water, Preservation and Storage of Forage Crops, Reclamation of Coal Mine Spoils, and Irrigated Pastures.

Of these nine subjects, four and possibly five represent particular aspects of American agricultural conditions or activities. However, if British interest must this time be restricted for these reasons, British Commonwealth interest will perhaps be less restricted; Australian soil scientists will certainly find that more of this American material has a bearing upon their problems.

The weakness displayed in the first volume—the almost exclusive reliance upon American research references—is repeated. Thus, in the section devoted to soil nitrogen, as generally world-wide a topic of soil science as could be discussed, there are only five or six non-American references in a list of about 120. Yet this subject was being studied in Europe and Britain years before American agricultural research can be said to have started; and in the past two decades it has been particularly studied at Jealott's Hill Research Station. In the section on forage crop storage and preservation, however, the authors have commendably cast a wider net. British work on dried grass and European work on the acid process for silage making are well noted.

The section on reclaiming coal mine spoils has topical relevance for Britain. Broadly, it is a survey of our own open-cast mining problem as experienced in the United States. In four U.S. States reclamation of land after open-cast coal mining is now compulsory. A sentence from this vast country with so much more soil per head than Britain is well worth quoting: "Since the United States has passed the pioneer era of unlimited land resources it seems appropriate that restrictions be imposed upon the destruction of the productive capacity of land." Only a quarter of a million acres of America has been, or is, mined for open-cast coal.

It is salutary to realise that the problem has been sufficiently studied there for a substantial survey of progress to appear in this book. A point made by the American authors, and one that deserves emphasis, is that "each acre mined affects the land use of at least one more acre of the neighbouring land."—D. P. H.

* *Advances in Agronomy* (*Vol. II*). Edited by A. G. Norman. Pp. 407+xi. Academic Press Inc., New York. Price 44s.

Microbiology and the Chemist

THE third edition of a handy little book,* which can be consulted with advantage by anyone seeking for information on the practical application of microbiology, has just been published. Galloway and Burgess originally collaborated to write a book on applied mycology and bacteriology, and while it was a very useful work to have on the shelf, it must be confessed that it gave the impression of two authors who were not always sufficiently in harmony. The present author accepts full responsibility for the third edition, and in comparing the present work with the original, the reader thinks instinctively of the maturing of wine in the bottle and the removal of deposit on recorking.

The outstanding feature of this edition is the improvement in the presentation of the material. The first edition appeared in 1937, the second was rather hurried owing to war conditions, and it is to be hoped that in a fourth edition there will be more detail of manufacturing processes which are essentially the result of microbiological synthesis or analysis, or which are dependent on the maintenance of sterile conditions of manufacture and packing.

There is hardly a subject omitted in which microbiology plays a part, but it would considerably enhance the value of the book if rather more space were devoted to more modern developments, such as the antibiotics, the proofing of fibres against rot, etc., subjects which have been given intensive study during the last war. This would be a difficult task to accomplish with the author's desire to give junior laboratory workers a wider general knowledge of the activities and potentialities of micro-organisms, and he must be congratulated on the great success he has attained in this direction.

In view, however, of the short supply of books of this general character, written from the practical standpoint, in the reviewer's opinion the author should either expand his material or write another book of a more detailed type which would include a larger bibliography.

It is very pleasing to note that the author stresses the fact that a sympathetic co-operation of the chemist, the botanist, and the pathologist is essential for further advances in microbiology, and, although he assumes a general background of knowledge of bacteriology on the part of his readers, he has produced a pleasantly written little volume, which can be read with advantage by any foreman or departmental manager in a factory where hygiene is essential or where products are dependent on freedom or otherwise from particular micro-organisms. Perhaps a few words may not be understood at first, but if its perusal should awake a desire for more specific knowledge by such people, from this angle alone the author's time will not have been wasted.—T. McL.

* *Applied Mycology and Bacteriology*. By L. D. Galloway, M.A.(Cantab.). 3rd edition. Pp. 184+ix. Leonard Hill, London. Price 12s.

Continuous Butter Production

N. KING,

Professor, Statens Mejeriförsök, Alnarp, Åkarp, Sweden.

Buttermaking is principally a two-stage concentration of the milk fat from about 3 per cent. to about 80 per cent., and makes use of two main unit processes, firstly, the separation and, secondly, the churning and working, the accessory processes being the pasteurisation and the ripening and ageing of the cream. Concurrently with the development of the butter industry there has been an increased tendency to pass from the batch to the continuous system—a change-over which was performed many years ago in the case of separation. The attempts to achieve continuity in the second step of the fat concentration, however, have achieved a definite practical success only in the last few years, and in a short period of time there have been elaborated a number of new processes for this purpose. These methods are now being widely tested and in some countries are already used on a commercial scale.

THE main distinguishing features of the separation methods are re-separation of the primary cream to a very concentrated cream, and chilling and working of this cream product, whereby it is converted into butter. These chief unit processes are performed in a separator of airtight type and in a combined chiller worker. In the case of different modifications of the separation methods these main processes may be accompanied by various by-processes (*e.g.* standardisation, salting, aromatisation, etc.), and the construction of the apparatus and the working sequence may vary, depending upon the characteristics of the raw material and the requirements of the finished product.

Distinction between Processes

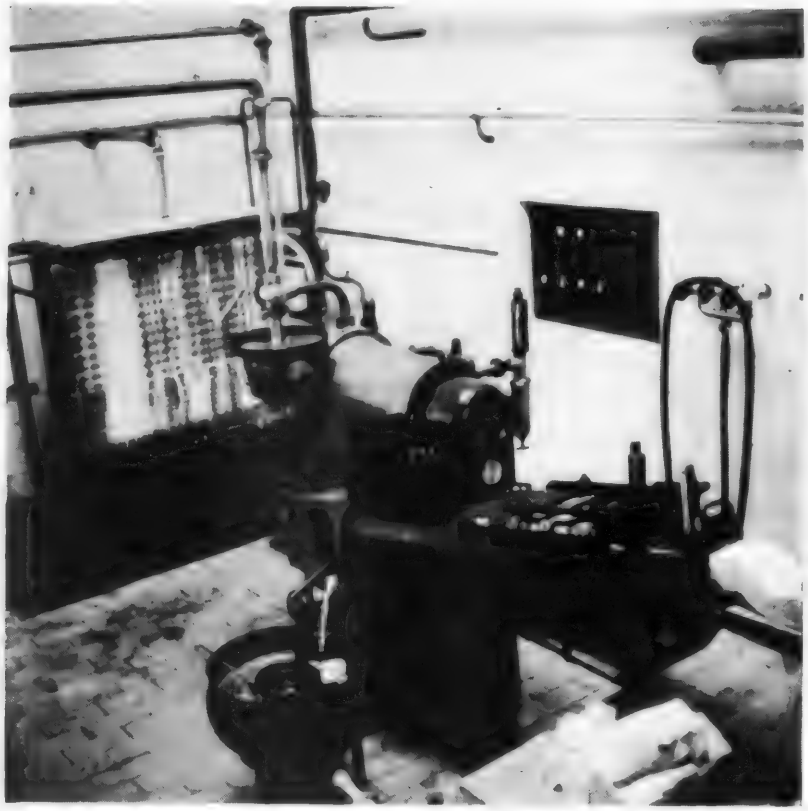
According to Stigen, Berglöf, and Hansson, distinction must be made between two modifications of the Alfa process, namely, the Swedish Alfa-Laval process and the German Alfa process (Alfa Butterung). The first relates to a salted and aromatised butter, with a moisture content not exceeding 16 per cent., while the other was originally developed for unsalted sweet-cream butter containing up to 20 per cent. moisture. Both these modifications were developed by Aktiebolaget Separator in Stockholm in collaboration with Astra-Werke in Hamburg-Bergedorf.

Abstract of papers on continuous buttermaking presented at the XIIth International Dairy Congress held in Stockholm.

The Swedish Alfa-Laval Process

The main units of the Swedish Alfa-Laval process are the cream concentrator, a separator of the airtight type, where the primary cream with about 30 per cent. fat is concentrated to about 82 per cent. fat; the dosing outfit, a mixing vat with agitator and a feed table with containers and feeders for dry salt, aroma mix, and colouring matter; and the transmutator, a device for chilling and working the concentrated cream, consisting of three jacket-cooled cylinders, connected in series and provided with closely fitting internal rotors which bear on their surface spiral-shaped ribs, carrying the cream and butter forward. In the transmutator, before leaving the middle cylinder, the phase inversion takes place at about 14° C. Depending upon the iodine value of the butterfat the temperature in the cylinders may vary.

German Alfa continuous buttermaking machine at Elmshorn, direct-coupled to the packaging machine.



Westphalia-Fritz continuous buttermaking machine at Bielefeld, direct-coupled to packaging machine.

In the case of a low iodine value the temperature in the second cylinder is lower and is permitted to rise somewhat in the third. In the case of a high iodine value the temperature in the third cylinder is the same as in the second, or slightly lower. The moisture content in the concentrated cream is determined by the pressure at the cream outlet of the concentrator and by the fat content and temperature of the thin cream.

German Alfa Process

The German Alfa process described by Mohr is closely related to the Swedish Alfa-Laval process, possessing some minor deviating features. The phase inversion also occurs in passing the second cell, but at a somewhat lower temperature (8° to 13° C.). The second separator and the chiller form together a closely connected system, and the moisture content of butter is controlled by means of a pressure regulation valve at the outlet of the chiller, which is cleaned every fourth to eighth week.

An eventual addition of aroma mixture and salt solution may be performed by means of an autoclave-like outfit which delivers these liquids with the aid of compressed air. This dosing outfit may be placed between the first and second cells of the chiller.

The New Way Process

Developed in Australia by the James Bell Machinery Pty., Ltd., Melbourne, the New Way process has as its essential units a no-foam separator for re-separating cream to 80 per cent. fat content; two vacuum cream vats for standardising the 80 per cent. cream to 16 per cent. moisture (salt is also added here), one to feed the extruder while the other is filling and being standardised; a New Way extruder for chilling and working the thick cream; and a moulding machine.

The extruder consists of a jacketed metal box containing two hollow cylinders with gear-like surfaces, which are placed side by side with a narrow clearance (about 0·3 cm.) and a similar clearance between the cylinders and the box walls. Refrigerating brine is circulated through the cylinders and the jacketed box. Since the machine can be easily dismantled, all surfaces are readily accessible for cleaning and sterilising. The concentrated cream entering the extruder and the butter resulting from the chilling and working action are forced to the exit end by the gearlike surfaces of the revolving cylinders, remaining in the extruder less than two minutes, and emerging at about 1° C.

The Cherry-Burrell Process

Joint research by the Cherry-Burrell Corporation, Chicago, and the Sugar Creek Creamery Company, Danville, Ill., resulted in a process for producing butter from both sweet and sour cream.

The cream with a fat content of 30 to 40 per cent. is heated to 48·9° C. in a centrifugal heater, a vertical steam jacketed cylinder provided with an agitator, which exerts a lifting action on the cream, the blades on the top of the agitator forcing the cream from the heater. The heater performs a threefold purpose:

1. The cream is heated to a temperature most suitable for separating.
2. The lumps of curd are broken and the fat liberated.
3. The emulsion state of the cream is weakened, so that the separator can break the fat emulsion.

Re-separation is accomplished in a De Laval separator which is provided with three discharge ports, one for the fat concentrate, one for "light skim" (usual skim milk), and one for "heavy skim" (skim milk containing curd). The fat content of these three products (in the case of a good operation) was as follows: in the fat concentrate between 82·7 and 91·3 per cent., in the "light skim" between 0·16 and 0·30 per cent., and in the "heavy skim" between 0·96 and 2·2 per cent.

Vacuum Pasteurisation

The fat concentrate passes through a balance tank, where a

preliminary neutralisation can be performed, to a vacuum pasteuriser (Vacreator). The Vacreator consists of three chambers, in the first of which the concentrate is heated to 93·3° C. (in less than a second), in the second is subjected to vacuum treatment and steam distillation at about 76·7° C., and in the third chamber is cooled to about 43·3° C.

The fat concentrate is now accumulated in the standardising vats, where it is analysed for moisture, curd, and acidity, and then standardised to 80 or 80·2 per cent. fat. The acidity is reduced to a *p*H of 6·8 to 7·0. The curd content lies between 0·5 and 1·1 per cent. By means of agitators and baffles there is produced a uniform mixture of the fat and moisture. In order to avoid an eventual crystallisation of the fat in the standardising vat, the standardised mixture is held at 40·6° to 43·3° C., since at 35° C. there may result mealy butter due to the growth of large fat crystals. Besides water and neutraliser salt, flavouring and colouring matters are also added at this stage.

Chilling Operation

Chilling and partial working of the butter are performed in the chiller worker, which consists of two horizontal jacketed tubes equipped with scraper blades and agitators for working the butter. The tubes are ammonia cooled. The fat concentrate is chilled in the first tube from 43·3° to about 10° C., and in the second tube to about 4·4° C. The discharge temperature varies between 4·4° and 7·8° C., depending on the properties of the fat, the temperature being raised as the fat becomes harder. On the chiller may be provided a means of adding nitrogen to the butter (about 4·7 vol. per cent., a quantity corresponding to the air content in ordinary butter).

An additional working for attaining a good "spreadability" is accomplished by passing the butter through a texturator, a cylinder with funnel-shaped connexions on either end. On the passage of the butter through the texturator the crystallisation of the fat continues, as indicated by a slight rise in temperature (1° to 1·7° C.). The rise in temperature continues for 15 to 20 minutes, and the butter becomes somewhat firmer.

Physico-chemical Aspects

In order to control properly the characteristics of these new butter types, an insight must be gained into the intimate physico-chemical nature of the processes involved. This task is not an easy one. The main phenomenon involved in the chilling and working process, the phase inversion, has been characterised as "a most mysterious phenomenon."

Besides the phase inversion there are other phenomena involved, as, for example, the crystallisation of the fat in the globules and in the free form in the butter, thixotropic phenomena, etc. Viewed from the standpoint of rheology a separation method represents an interesting sequence of pronounced rheological changes, from the liquid primary cream to the half-liquid concentrate and more or less firm butter of appropriate consistency.

Beginning with the re-separation, in spite of the fact that the fat globules in the concentrated cream lie very tightly so that the globules are partly deformed, this product still represents a proper emulsion "fat-in-milk plasma," with approximately the original dispersion degree of the fat as could be shown by dilution tests and by determination of the size frequency of the globules. The mutual deformation of the fat globules due to the tight packing is considered to be the first stage in the formation of Alfa butter.

In another paper it was suggested that the following processes take place in the cylinders of the transmutator:

1. Cooling of the concentrated cream to a temperature below the phase inversion point.
2. Phase inversion.
3. Establishment of a certain ratio between the percentages of the globular and free fat.
4. Final dispersion of the water phase.

Simultaneously there proceeds the crystallisation of the fat.

The occurrence of a phase inversion in the case of the Alfa butter has been demonstrated by microscopical investigation in ordinary and in polarised light of a normal preparation and of a preparation warmed to 40° C., by dilution tests, by diffusion tests, and by the determination of the dielectric constant, etc.

This inversion in the concentrated cream takes place within a temperature range of about 12° to 18° C. On the other hand, within this temperature range considerable changes occur in the crystalline state of the butterfat which in turn may precipitate the inversion process.

Before reaching the final stage, the concentrated cream passes through several intermediate emulsion forms. By changing the manufacturing conditions it is possible to attain a final product possessing one of these intermediate forms.

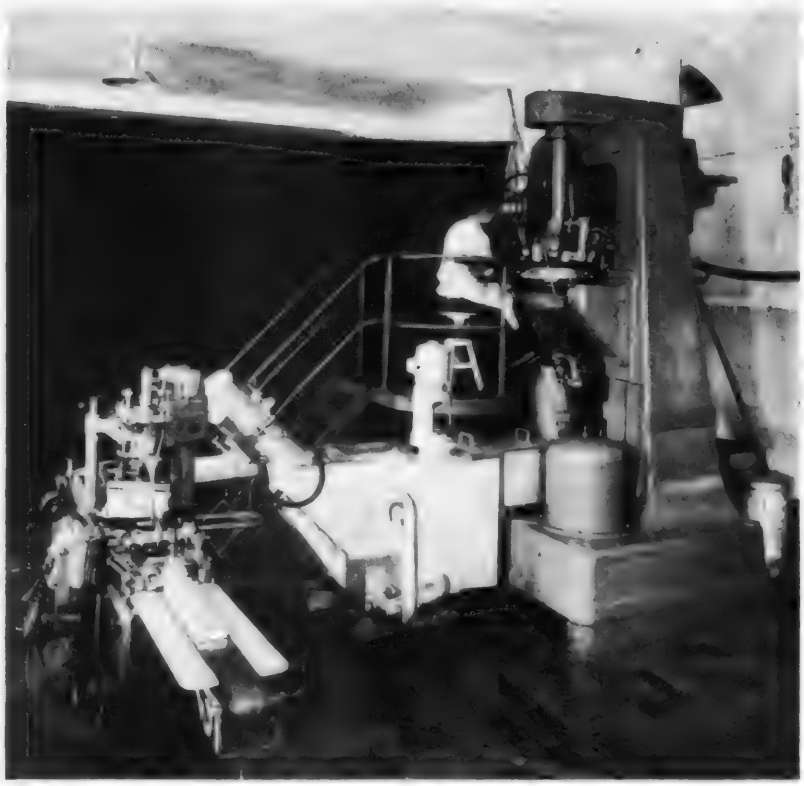
Presence of Globular Fat

The phase inversion proceeds, according to Mohr, as follows: On rapid cooling the fat solidifies to a jelly (a very fine dispersion of the crystalline in the liquid fat). Because of this change the adherence of the membrane material is diminished and a part of the globules lose their membranes and coalesce to a jelly mass, which encloses the minute plasma droplets, a certain amount of the globules (presumably containing the fat of higher solidifying point) remaining intact.

The occurrence of these globules points to the fact that besides the fat in the form of a jelly in the Alfa butter a portion of the fat exists in a crystalline, at least in an orientated, form.

For the average amount of globular fat in Alfa butter, values ranging from 14, 24, and 30 per cent. have been given. The corresponding values for the ordinary butter were 18 to 28 per cent., and for the Fritz butter 14 to 17 per cent. It is possible that the composition of the globular and free fat, as well as the amount of fat globules, influence the hardness and consistency of the butter.

In the Cherry-Burrell process a



Carbon dioxide buttermaking machine in operation with an automatic packaging machine.

partial demulsification of the fat occurs through the agitating effect in the heater and perhaps also at the re-separation. This butter therefore probably contains more free, non-globular fat, which in turn may have an effect on the characteristics of this kind of butter.

The dispersion degree of the water phase plays an important role in the structure and keeping quality of the butter. While in a properly worked soured cream butter the plasma droplets reach a diameter of 10 to 20 μ, a normally manufactured Alfa butter is characterised by a fine and uniform dispersion of plasma, the maximum diameter of the droplets being 3 to 5 μ. Data in the table show that the dispersion degree of the plasma and thus the keeping quality of the Alfa butter are affected by the temperature at the end of the second cooling cell.

Keeping Quality

The keeping quality of a properly manufactured Alfa butter is superior to that of ordinary butter, owing to the fact that in the minute water droplets the multiplication of the bacteria and thus also the formation of bacterial enzymes deteriorating the quality of the butter are greatly inhibited. In addition, the interface "plasma-fat" containing also lecithin is appreciably increased through the fine dispersion of the plasma, so that lecithin is brought into a closer contact with the fat, on which it exerts an antioxidative action. The Alfa butter also contains more lecithin than the ordinary and Fritz butter. On the other hand, oxidative substances occurring in plasma, e.g. copper, exert a more pronounced deteriorative action in the Alfa butter, owing to the increased impact area "plasma-fat," and therefore copper must be avoided in the construction of an Alfa plant.

A properly manufactured Alfa butter is practically free from air, while ordinary butter contains 3 to 6 per cent. and Fritz butter 6 to 9 per cent. Due to the leakages in the tubular system air may be found also in the Alfa butter. In the Cherry-Burrell process a certain amount of nitrogen (about 4 to 5 vol. per cent.) may be intentionally introduced into the butter.

Temperature at the End of the Second Cell.	*Water Dispersion.*	*Keeping Quality.*
15° C.	Incomplete phase inversion (cream droplets in the butter)	Impaired
8° C. to 13° C. ..	Very fine and uniform dispersion	Good
4° C. to 6° C. ..	Large plasma droplets	Impaired

Granule Formation

In ordinary churning the butter passes through the intermediate stage of granule formation, and it is possible that the granules worked together to a coherent mass still retain extremely thin aqueous layers on their boundaries. These layers may form in the butter an aqueous network which may somewhat loosen the body of the butter. The Alfa process lacks the intermediate step of the granule formation, and this kind of butter possibly does not possess such a system of aqueous interfaces, and is, therefore, closer in body.

Such an incorporation of water network has possibly taken place in an experimental arrangement, where the half-fluid Alfa butter was dropped from a cooling cell at about 13° to 15° C. into cold water (3° to 4° C.). After a temperature rise to 16° to 17° C. these butter flocks were worked together. The butter obtained was plastic, and the typical body of the Alfa butter was thus avoided.

Since a definite period of time is required before the crystallisation in the butterfat attains an equilibrium, it is evident that the crystallisation in the Alfa butter cannot be completed in the short time of passage through three cooling cells (about two minutes on each cell). The crystallisation of the undercooled fat advances further after the butter leaves the transmutator. According to Weinreich, there could be observed a continued crystallisation in the

Cherry-Burrell butter in passing the texturator and during the subsequent 15 to 20 minutes, as indicated by a rise in temperature.

Factors affecting Butter Hardness

Besides the crystallisation processes, thixotropic phenomena, usually associated with the working or kneading, also influence the hardness and consistency of the butter. The importance of this factor was emphasised for the ordinary and also for Alfa butter. Instructive data were given on the effect of working on the consistency of Cherry-Burrell butter. A butter sample taken from the first cylinder of the chiller worker at 10° C. becomes very hard and brittle in about one minute. After the butter is allowed to pass the second cylinder, where a further working takes place, it is somewhat less hard and brittle, in spite of additional crystallisation of fat. When this butter is allowed to stand for three or four minutes and then worked gently, it becomes first waxy and pliable, and after a few hours plastic and spreadable. This additional working is performed in the texturator.

Rheological Properties

In explaining the differences in the rheological properties of ordinary butter and butters made by separation methods, there must also be taken into consideration the discrepancies in the duration and sequence of the unit processes in both these cases.

The occurrence of the fat globules, which mostly originate from the cream used for the buttermaking, has long since been verified in the ordinary butter, and recently also in the Alfa and Fritz butter.

According to the Creamery Package Manufacturing Company's process (the re-emulsification method), although no published data are available concerning the structure of butter made by this process, it must resemble that of margarine, the fat globules being absent. Wiley and Loftus Hills in their paper indicated a possibility of the occurrence of artificial (pseudo) fat globules in this kind of butter. These authors have observed that in butter concentrate, a product developed in Australia and consisting of a mixture of butterfat (with addition of small quantities of hydrogenated peanut or cottonseed oil), salt, and dried skim milk, there may appear under certain cooling conditions microscopic spherical masses of fat crystals which resemble fat globules. This cooling arrangement resembles the last stage of the Creamery Package Manufacturing Company's process in the existence of the fat as a uniform continuous phase. It should be worth while to investigate more closely the physical structure of these pseudo-globules and the conditions of their formation.

Improvement in Butter Quality

Concerning the quality of the butter, the Alfa-Laval butter (from two Swedish dairy plants over a period of one year) has consistently conformed to the quality demands for the Swedish quality brand label, based on the regular government quality control, and the average quality points for Alfa-Laval butter have been practically identical with the average for the entire country. As to the quality of the Cherry-Burrell butter, Weinreich states that it has a closer texture and finer body than the ordinary butter, and even the keeping quality (seven days at 21° C.) is superior.

An improvement in the quality of the butter may be attributed to the following factors:

1. Avoidance of bacteriological contamination from the air, hands, wash water, and especially from the wooden equipment (churn).
2. Fine and uniform distribution of the moisture.
3. Avoidance of the oxidation of butterfat through a greatly reduced air content.
4. A better control of the composition and properties.

On the economical side of these processes are emphasised the following savings in expense:

1. Reduction in the space occupied by the equipment (reduced building costs).
2. Decreased water and steam consumption.
3. Reduced power requirement.
4. Reduction of labour.
5. Increase in the yield of butter.

The increase in yield is achieved through reduced fat loss on re-separation as compared with the fat loss in churning; increased curd content; complete control of the maximum permissible moisture content; and avoidance of cream spillage and butter adhering to churns.

The New Way continuous buttermaking machine at work at Terang butter factory, Victoria, Australia.

In testing the Alfa-Laval process in New Zealand difficulties were encountered in the control of the moisture content of the butter, the handling of some types of farm-separated cream, and in obtaining a satisfactory packing of the butter. Further, there was a tendency to a laminated appearance due to the filling system in boxes.

A comparison of methods of the usual buttermaking process, the Fritz process, and the Alfa process did not reveal any larger differences in the final grading results. In comparing the continuous methods with the ordinary method of buttermaking it is important to take into consideration the exact manufacturing conditions (temperatures, times, acidities) applied in ordinary buttermaking, since the properties of the butter are closely connected with these conditions, especially the temperature treatment of the cream and the working conditions of the butter.

BIBLIOGRAPHY

Schulz, M. E. *Milchwissenschaft*, **2**, 293-303. 1947.

Schulz, M. E., and Schulz, W. *Milchwissenschaft*, **3**, 213-224, 253-259, 1948.

Mohr, W. Internation. Milchw.-Kongress 1931, **2**, Sect., 137-156.

Adam, N. K. The Physics and Chemistry of Surfaces. 3rd ed. London, 1941. P. 149.

Mulder, H. Zuivelonderzoek. II. Hague, 1947. Pp. 63-64.

Loftus Hills, G. *Australian J. Dairy Technol.*, 1946 (Apr.-June).

McDowall, F. H., and McWhirter, G. M. *New Zealand J. Agric.*, 1948, July, 15-17.

Kellermann, R. *Milchwissenschaft*, **4**, 40-46, 1949.

The Impact of the Self-Service Store

THERE may not yet be many self-service shops or stores in Britain, but if anyone questions whether this idea has come to stay or whether it can expand he will be well advised to study a recent report.*

Surveys on the spot, that is, where the public has had the opportunity to shop by the self-service method, have shown that the traditional British conservatism towards new ideas is not being displayed in this matter. Seventy-five per cent. of the shoppers interviewed preferred self-service, 18 per cent. preferred staff and counter service, and 7 per cent. had no preference. Eighty-seven per cent. found self-service quicker; 92 per cent., had no difficulty in finding goods for themselves. It is sometimes suggested that older people will take to the self-service system less readily, but a higher percentage of women shoppers over 35 expressed preference for this new method of shopping.

Experiences of self-service introduction in Britain have so far demonstrated a number of advantages to the shopkeeper. Wage costs per £ sale fall, turnover increases, and net profits are larger. Shop appearance is improved and the peak-hour problem of congestion in the shop is solved. It is popularly supposed that only large shops can adopt the system effectively, but in the United States, where self-service has been much longer developed, well over half the grocery and general shops which had adopted self-service in 1939 were shops with turnovers below 50,000 dollars a year.

For the food manufacturer the development of self-service retailing brings important consequences. Enormous emphasis is placed upon the pack. In the words of the report "the whole retail responsibility of selling the product is put on the product itself, the package it wears, and the name it carries. . . ." If possible the name should appear on every surface of the pack; for in self-service shops goods are often placed back to front or are placed with the ends rather than the sides showing. A box shape is the most suitable; for this is the easiest to pack in numbers on the shelves. All reading matter must be very clear. The use of a plastic film or Cellophane window to show the contents is one of the most successful devices of sales appeal in self-service display.

It has been found that a considerable proportion of purchases in these shops is made on impulse. To encourage this, the pack should have a design that is both attractive and distinctive; also, however low-priced the product, the pack must suggest quality. The "cheap" pack for low-priced goods suggests shoddiness. On the other hand, too elegant a pack may mislead the glancing shopper into thinking that the product is a luxury article at a high price and thus discourage further inspection.

In self-service food shops, loose goods such as dried peas or fruits will be prepacked by the retailer or in some cases by the wholesaler or producer. There is a tendency for more of this kind of prepacking to be done at the retailer level as the packing operation can then be adjusted to current sales demand, and risks of spoilage and deterioration are reduced to a minimum. The transparent bag lends itself to this operation; it may indeed be that self-service and the use of packing or wrapping materials like Pliofilm will be complementary expansions of the future.

One factor of product presentation that must assume greater importance in the self-service shop is the brand name. The influence of the shop assistant in persuading customers to buy this or that product is lost. The familiar brand name will exert an even more powerful influence under self-service and self-choosing conditions. A product must be its own "silent salesman." The well-advertised product with a familiar and reputable brand name, offered in an attractive pack, is certain to move the fastest from self-service shelves.—D. P. H.

* *Self-Service in Britain.* Pp. 72. British Market Research Bureau, London. Price 2s. 6d.

TO AUTHORS

FOOD MANUFACTURE is prepared to consider the publication of any books on scientific and technical subjects which authors might care to submit.

Hydrolysed Meat Proteins

THE breakdown of meat protein to a mixture of amino acids* yields products of considerable value as auxiliaries to the average basic diet. They fulfil at least two functions: development of an attractive flavour in soups, sauces, and processed vegetables; and stimulation of the secretion of gastric juice. Moreover, since the relatively recent discovery of the role of certain amino acids as growth hormones, the small daily intake of amino acids (or their sodium salts) in the form of hydrolysed protein is regarded by some authorities as a means of more efficient utilisation of the total nutriment.

The German term for these products (*Suppenwürze*) testifies to their property of acting as "spicing" agents, and this function was vividly exemplified during the last war, when products such as "Maggi" were invaluable in overcoming the distaste of the populace for the compulsory diet of potatoes and other vegetables. Incidentally, not only are such foods rendered much more palatable by the amino acid mixture, but their satiating power is improved by virtue of the fact that they then remain in the stomach for a longer period.

Composition of Hydrolysed Meat Protein

Table I gives the analytical data for a first-grade product (first column) and for one which barely complies with the German official standard:

TABLE I.

	Per Cent.	*Per Cent.*
Water	50—52	55—60
Organic matter ...	27—31	20—25
Nitrogen	3·8—4·5	3—3·5
Nitrogenous matter (N × 6·25)	23—28	19—22
Amino acid nitrogen	2·8—3·2	1·5—2·5
Mineral matter ..	18—20	20—22
Sodium chloride ...	16—18	18—20

It will be seen that the amino acid nitrogen may represent about three-quarters of the total nitrogen. The products constitute a saturated solution of sodium chloride and amino acids (or their salts), so that it would be quite impossible to increase the salt content and still maintain the correct nitrogen content. Since 0·25 to 0·5 ml. of product is all that is required for a plate of soup, there is obviously no risk of excessive salt intake.

Some attention has been given to the question of an organoleptic testing procedure for the evaluation of hydrolysed meat protein as well as of protein concentrates, and reference may be made to the procedure outlined by Wilhelm.[1]

Meat Protein Concentrates

Pioneer work in the field of meat protein concentrates was carried out by Waser,[2] who effected the concentration by freezing and then obtained a "meat concentrate powder" by evaporation to dryness in high vacuum. His average yield of powder was 3·8 per cent., calculated upon the original weight of meat. Like the hydrolysed proteins, this class of product is regarded mainly as an aid to appetite, although the composition is naturally different.

According to Waser the organic constituents include creatinine, creatine, hypoxanthine, carnosine, methyl guanidine, taurine, cystine, glutamic acid, acetic acid, and lactic acid. Of these, glutamic acid undoubtedly makes a large contribution to the appetising flavour. Sodium glutamate is a favourite means of imparting a meaty flavour to the rice-rich diet of the Japanese. The higher molecular colloidal substances such as albumen, albumoses, and peptone do not contribute to the flavour.

Lobanov and Bikowa[3] reported that in the process of extraction of meat with hot water the coagulable, soluble proteins are mostly extracted in the course of the first half-hour before the liquor has reached the boiling point; at the end of this period 81-84 per cent. of these substances have passed into the liquor. Extraction of the remainder proceeds uniformly when the lumps of meat are approximately of the same size.

An extensive study of meat proteins and the extractive substances of meat was carried out by Beck and his co-workers.[4]

German food regulations differentiate between products on the basis of meat extractives, chicken extractives, and yeast extractives respectively, all of which appear on the market in the form of cubes, tablets, granules, pastes, or liquids. For all of these the regulations prescribe a minimum soluble nitrogen content of 3 per cent. and a maximum sodium chloride content of 65 per cent. Admixture of thickening agents, dyestuffs, and nitrogenous compounds is not permitted.

Table II below indicates the permissible ranges within which the various constituents of typical products may fluctuate.

Products of the protein concentrate cubes (meat basis) type are manufactured from evaporated hydrolysed protein, beef extract (or other meat extract or chicken extract), common salt, fat, spices, and herbal decoctions. It is also permissible to include minor

TABLE II.

	Protein Concentrate Cubes (Meat Basis). *Per Cent.*	*Protein Concentrate Cubes (Non-meat Basis).* *Per Cent.*	*Protein Concentrate Paste (Fatty) (Meat Basis).* *Per Cent.*	*Protein Concentrate Paste (Non-meat Basis).* *Per Cent.*
Water	2—3	2—3	5—10	5—15
Organic matter ...	30—35	25—30	45—60	31—36
Mineral matter ...	60—65	60—68	38—43	50—58
Sodium chloride ...	58—62	58—64	35—40	48—55
Total nitrogen ...	3·5—4·0	3·1—3·5	3·1—3·6	3·1—4·0
Nitrogenous matter (N × 6·25)	22—25	19—22	19—23	19—25
Amino acid nitrogen	2·2—3·0	1·5—2·5	1·5—2·5	1·5—3·0
Creatinine	0·5—0·7	—	0·5—0·7	—
Fat	5—8	4—7	25—35	9—10

* Strictly speaking, these products comprise a mixture of the sodium salts of the amino acids (since the acid hydrolysis is followed by neutralisation with sodium carbonate or hydroxide) and the sodium chloride formed during the neutralisation.

amounts of herbs, *e.g.* parsley, or root vegetables, *e.g.* carrots, which are common ingredients of meat concentrates on the basis of fresh meat. Protein concentrates on a yeast basis must contain at least 10 per cent. of yeast extract. Products of the type mentioned in column 2 differ from those in column 1 (as well as from those on a yeast basis) in that they may contain unhydrolysed bone broth, whale meat extract, or fish extract. If horsemeat extract is present it must be indicated on the label.

Pastes of the type exemplified in column 3 are relative newcomers to the industry, having been introduced some fifteen years ago. Apart from their considerably higher calorific value they remain in the stomach for a longer period than the low-fat concentrates and thus have a superior satiating power, resembling on this latter count the hydrolysed protein preparations. The high fat content naturally renders them more liable to rancidity, although in suitable packs they should keep for one and a half to two years at temperatures below 30° C. provided that they are stored in a dry atmosphere.

(From Chapter 8 of *Suppen, Sossen, Würzen, und Brüherzeugnisse*, by Dr. K Schiller, Stuttgart, 1950.)

REFERENCES

1. Wilhelm, *Deutsche Lebensmittelrundschau*, 1941, p. 85.
2. Waser, *Z. Untersuch. Lebensmittel*, **40**, 289, 1920.
3. Lobanov and Bikowa, *Z. Untersuch. Lebensmittel*, **69**, 313, 1935, and **70**, 150, 1935.
4. Beck *et al.*, *Zeitschrift für Untersuch. der Lebensmittel*, **75**, 119, 1938, and **76**, 289, 1938.

National College of Food

FOLLOWING negotiations between the Ministry of Education, the Ministry of Food, and representatives of various sections of the food industry, it has been decided to establish a National College of Food Technology in London about September next.

As a temporary measure the College will be housed within the premises of the Smithfield Technical College and some nearby premises adapted for the purpose. Plans are being prepared, however, to provide new premises in the near future.

The College will provide the different sections of the food industry with training at a high level. This will include the handling, preservation, and processing of meat, fish, and other foods together with their various derivatives and by-products. It will also deal with those branches of science most closely concerned with changes which take place in food during preservation and processing. This training will be particularly valuable for food scientists and others employed in the food industry either on the manufacturing side or on research.

Since the College will deal with studies beyond the ranges normally covered by technical colleges, the students will attend on a full-time basis. As it is generally accepted that the basis of advanced technology is a good groundwork in science coupled with industrial experience, the students must be drawn from industry at a comparatively late age in life (usually at 23 or more years of age). It has been necessary, therefore, to secure the full support of the different sections of the food industry so as to ensure that the instruction will be up to date and that candidates selected are of the type required by industry for responsible posts. This support is already assured, the Food Manufacturers' Federation, the Institute of Meat, the National Federation of Fishmongers, and the Co-operative Wholesale Society having given guarantees that students will be forthcoming from the sections of the industry they represent.

The College will follow the pattern of other colleges set up for industries in which the number of responsible persons engaged is relatively small, and where training of a high standard on a regional basis would be uneconomic.

A Board of Governors, consisting of the following, has recently been appointed by the Minister of Education on the nomination of the interests concerned:

Chairman:

Frank Shires (Food Manufacturers' Federation).

Vice-Chairman:

John Hammond, F.R.S., M.A., D.Sc. (School of Agriculture, Cambridge).

Other Governors:

Nominated by the London County Council: F. J. Clark, D. S. Game, R. C. Hammett, Mrs. D. M. Holman, M.A.

Nominated by the Institute of Meat: W. R. Wooldridge, Ph.D., M.Sc., M.R.C.V.S., J. A. Brewster, M.Inst.R., E. J. Evans, Ph.D., M.Sc., E. Smith, E. H. Ashley, F. E. Martin, M.R.San.I.

Nominated by the National Federation of Fishmongers: S. I. Vandersluis, H. J. Eva.

Nominated by the Co-operative Wholesale Society: B. T. Eccles, H. M. Schofield.

Nominated by the Trades Union Congress: W. E. Padley, M.P. (Union of Shop, Distributive, and Allied Workers), T. Healey (Transport and General Workers Union).

Nominated by the Worshipful Company of Fishmongers: J. S. Barclay.

Nominated by the Worshipful Company of Butchers: E. J. Baldwin.

Nominated by the Food Manufacturers' Federation: Sir Harry Hague, C. S. Dence (Brand and Co.), W. R. Hare (Reckitt and Colman), A. R. Pegler (J. Lyons and Co.), G. W. C. Severn (Horlicks), R. N. Wright (Crosse and Blackwell).

Nominated by the Department of Scientific and Industrial Research: Franklin Kidd, C.B.E.

Our Contemporaries

WIDELY grown in the U.S.A. as a forage crop and as a source of sugar, sorghum is also the staple food of millions of people in Africa and Asia. Considerable work has been done in the U.S.A. on the improvement of sorghum as a forage and sugar crop, but little has so far been published about its amelioration as a food grain for human consumption. Mr. S. H. Evelyn, A.I.C.T.A., Senior Cotton Breeder of the Empire Cotton Growing Corporation, gives, in the February, 1951, issue of *World Crops*, a general account of the genus and of investigations in its improvement as a human food grain by selection and breeding carried out in the Anglo-Egyptian Sudan.

In the same issue are discussed the factors responsible for the losses which occur in perishable fruit and vegetables during storage and transit.

Food Analysis

AFTER giving a series of lectures for some twenty years, Professor M. A. Joslyn has felt impelled to amplify and commit his notes to print* for the benefit of a wider audience than that which sits at his feet in the University of California. Prof. Joslyn, appreciating the use of physical apparatus and physical chemical methods for routine food analysis and control, has compiled what is the first comprehensive volume on the subject.

Scope of Treatment

After discussing the objects and errors of statistical analysis and expression of results, methods of sampling, and the preparation of the sample, he proceeds more or less to fill the greater part of the book with descriptions of methods of determination of moisture and ash, processes of extraction, densimetric methods, refractometric methods, polarimetry, colorimetry and spectrophotometry, potentiometric and similar methods, electrometric determinations, viscometric and other physical methods, and finally devotes about one-third of the volume to more specifically chemical methods of determinations, such as acidimetry, alcoholometry, and the estimation of sugars and other carbohydrates, pectins, tannins, and organic nitrogenous compounds.

A book of this type breaks fresh ground and is stimulating to the routine chemist, but it is a vast undertaking and, while the author states that he has endeavoured to write a book on food analysis which stresses principles rather than practices, he has covered so much ground that at times the text is almost a sequence of short sentences with references to the literature, rather than a discourse on the principles he is endeavouring to propound.

Again, one or two of the illustrations are taken from original articles or catalogues, and show various letters indicating portions of the apparatus, which are not described in the text. This is particularly noticeable with the illustration of the Cummins and Weymouth improved turbidimeter on p. 245, where there are twenty-five such letters and where a further explanation would make it clearer.

On account of the method of presentation various good points are liable to be missed by the practical worker, as for example the suggestion that the addition of a little tannin will help to stop frothing in the distillation of alcoholic beverages.

Moisture Determination

His advice on the preparation and quantities of samples to be taken for moisture determination could be read with advantage by most food analysts, especially his warning that moisture may be lost during the preparation of the sample or that caramelisation and denaturation may occur unless the method of drying is satisfactory and that such changes may influence the remainder of the analysis.

What is Adulteration?

There is a temptation to cross swords with Prof. Joslyn when he claims that "practice in the detection of adulteration in foods is no longer the primary purpose of instruction in food analysis . . . the interest in the preparation and marketing of foods retaining more of their original flavour, colour, and nutritive value, and in the development of new products has resulted in the need for food chemists with wider analytical training." It may be asked: "What is adulteration?"

Enzymes in Food

In spite of all that he has written, the author does not appear to mention the presence of enzymes in foods and their effect on cyanogenetic glucosides and other constituents. In warning the reader to be aware of loss of water of crystallisation in moisture determination processes, he fails to give guidance as to when this is likely to be lost. Similarly the impression is produced that his lecture notes needed further revision before publication; as an instance may be mentioned his references to criticisms of the Lovibond Tintometer by authors writing twenty-two years ago, while many of his references to other types of colorimeters deal with much more modern instruments. He should have discovered that manufacturers in Great Britain really do endeavour to bring their apparatus up to date.

In conclusion, the volume may be summarised by saying that it covers entirely new ground and is written from an entirely fresh angle, but that it suffers from the defect of being a compilation of lecture notes, which the author probably knows almost by heart, and that the proof reading has suffered in consequence.—T. McL.

* *Methods in Food Analysis Applied to Plant Products.* By M. A. Joslyn, M.S., Ph.D. Pp. 525. Academic Press, Inc., New York. Price $8.50.

The Confectionery Industry

(*Concluded from page 96*)

basic allocation of this material. At the same time the Ministry has made it clear that all possible sources of sugar from sterling areas are being taken up, and that any additional supplies to the industry would have to be drawn from dollar sources, a step which they are not prepared to take at this present juncture.

It would appear, therefore, that the future of rationing is entirely dependent upon the availability of sugar, and that the best that can be hoped for in the near future are successive small increases.

Difficult times lie ahead, since in the removal of controls the unwinding process can be even more complicated than the initiation procedure. Nevertheless, the industry wants freedom and realises that to gain such an objective it must be prepared to face all problems which will arise, in order that it may move forward in direct and healthy competition with allied food industries.

News from the Industry

FORTHCOMING EVENTS

Cake and Biscuit Conference

The 1951 Conference organised by the British Cake and Biscuit Association is to be held at Torquay from April 27 to May 1.

*

The Chemical Society

The programme of the Anniversary Meetings of the Chemical Society to be held in London in March will include:

March 20.

4 p.m. The Presidential Address "Concepts in Catalysis—The Contributions of Paul Sabatier and Max Bodenstein."

6.30-8.30 p.m. Reception and conversazione in the apartments of the Royal Society in Burlington House.

March 21.

10 a.m. Annual meeting of local representatives.

11.30 a.m. The one hundred and tenth annual general meeting.

12.15-4 p.m. Visits to research establishments in the London area.

7 for 7.30 p.m. The Anniversary Dinner.

*

Society of Chemical Industry

The following meetings conclude the 1950-51 syllabus of the London Section of the Society of Chemical Industry:

Apr. 2 and 3. A symposium on "Applications of Colloid Science to Industry" (joint meeting with London and S.E. Counties Section, R.I.C.).

Apr. 5. "Recent Trends in Fuel Research," Dr. A. C. Monkhouse, B.Sc., F.R.I.C. (joint meeting with London and S.E. Counties Section, R.I.C., and Luton Scientific Society). 7.30 p.m. at King's Fare Restaurant, King's Street, Luton.

May 7. "The Growing of Synthetic Crystals," L. A. Dauncey, B.Sc., and J. E. Still, B.Sc. 6.30 p.m. at the London School of Hygiene and Tropical Medicine, Keppel Street, London, W.C.1.

The last meetings in the 1950-51 syllabus of the Agriculture Group of the Society are as follows:

Apr. 12. "Soil Acidity" (joint meeting with the British Society of Soil Science). 10.30 a.m. at the Chemistry Lecture Theatre at the Royal College of Science, London, S.W.7.

Apr. 17. Crop Protection Panel. "Some Factors Affecting the Spread of Plant Virus Diseases," F. C. Bawden. 5.30 p.m. at the Geological Society, Burlington House, Piccadilly, London, W.1.

May 15. Agriculture Group annual general meeting. "Mushroom Composts and Mushroom Growth," Dr. R. L. Edwards. 2.30 p.m. at the Chemistry Lecture Theatre at the Royal College of Science, London, S.W.7.

June 9. Visit to the Veterinary Laboratory, New Haw, Weybridge.

The theme of the lectures at this year's annual general meeting of the Society is "Water in Industry"; the Lectures Committee, with Dr. H. E. Cox as chairman, were unanimous in choosing this title in that it offers considerable scope for original papers and discussion and should attract large numbers of visitors from overseas.

The lectures being arranged will cover the following subjects:

Availability of water supplies in Great Britain and their relation to the siting of chemical plants; water and crop production; hydroponics; heavy water; corrosion; water requirements for high pressure boilers; de-ionisation and the production of pyrogen-free water; water quality in the brewing industry; and pollution prevention and effluent disposal.

There will probably be additional lectures on other related subjects.

*

Films in Training for Industry

The first to be organised by the Scientific Film Association, a conference on "The Use of the Film in Training for Industry" will be held in the Hotel Majestic at St. Annes-on-Sea, during the weekend March 30 to April 1.

The conference will be opened on the Friday evening and immediately afterwards a number of films will be screened. Several examples of different methods of film planning for specific needs will be given.

The programme for Saturday will be divided into three broad sessions dealing respectively with films for training in the textile, engineering, and building industries. Speakers from these three industries will state how they use the films, which they will introduce and screen, for training in their own particular industry. There will be opportunities for discussion during each of the sessions.

During Sunday morning the work of the conference will be summed up and there will be further opportunities for discussion on this aspect of the use of scientific films.

Although a number of professionally made films will be shown, there will also be some amateur-made examples, of which latter type the Association has been promised a representative selection, and they would be glad to hear of others of the same type.

The fee to cover registration and expenses of the conference itself is one guinea, payable in advance to the secretary of the Association.

S.P.A. Microchemistry Group

Three meetings of the Microchemistry Group of the Society of Public Analysts and Other Analytical Chemists have been held during 1950 in London, Teddington, and Birmingham respectively. The Teddington meeting was held jointly with the London and South-Eastern Counties Section of the Royal Institute of Chemistry and the Birmingham meeting with the Birmingham and Midlands Section of the Institute.

An exhibition of microchemical apparatus was held in London in January 1950, and it is hoped to make this an annual event in connexion with the annual general meeting in London. In addition to this meeting, there was a spring meeting in Edinburgh in April, and an autumn meeting at Liverpool.

The number of Group members is now 341, an increase of 32 since the last report.

Eighteen members participated in the First International Microchemical Congress in Graz in July. The chairman, Ronald Belcher, who also represented the parent Society at the Congress, was one of the six internationally famed microchemists to have conferred on him the distinction of honorary membership of the Österreichische Gesellschaft für Mikrochemie.

A Sub-Committee on Micro-analytical Reagents have met several times during the year, their terms of reference being: (*a*) purity of reagents; (*b*) recommendation of standard substances. In order to assist the Sub-Committee in their work, the chief analyst of B.D.H. was co-opted.

Employees' Luncheon Club

Their latest experiment in the fostering of happy industrial relations in the organisation is the founding of a luncheon club by George Ellison, Ltd.

At the first meeting of the club, Professor A. M. Low, research physicist and technician, addressed representatives of the organisation on the importance of modern scientific research.

It is proposed to have a luncheon every two months, when speakers, each an acknowledged leader in his own particular field, will give their views on a wide variety of subjects. Employees of all grades will be given an opportunity of attending in turn.

Efficient Dust Collection

Designed to give high efficiencies when dealing with small particles of dust of either high or low specific gravity, the Sturtevant high efficiency scientific cyclone dust collector is based on fundamental aerodynamic principles.

In all cyclone design, for a given set of conditions, the smaller the diameter of the cyclone, the more efficient it will be when handling fine dust; the company's cyclone is therefore not made in large diameters, and where a greater duty volume is called for, a number of cyclones may be used.

The cyclone has a number of industrial applications; it can be used for salvaging food products in dust or powder form; cleaning stoker-fired boiler flue gases; collecting dust caused by machining processes or materials handling; and in any industry where high efficiency dust collection is of importance.

Exporting to Canada

As part of the services provided for exporters, the Board of Trade have issued a new publication entitled *Exporting to Canada*, compiled in the Department with the help and advice of the United Kingdom Senior Trade Commissioner in Canada and his staff. It concentrates on the more immediate and practical problems which confront the exporter, and aims to provide a brief summary of useful and relevant factual information.

The booklet offers a brief but comprehensive outline of the main features and exigencies of this market. It includes information about Canadian Government restrictions, duties, taxes, standards, specifications, and details of Canadian methods and practices in the sale and distribution of goods, credit terms offered, advertising practices, and sales methods, etc. It also deals with a wide range of other miscellaneous matters of interest to the exporter, including questions of shipment freights, packaging, samples, servicing, choice of agents, use of catalogues, and Canadian exhibitions and fairs, and it includes a chapter on the facilities offered by the Export Credits Guarantee Department. The booklet also offers certain suggestions on the technique of selling in North American markets.

Although these chapters contain much that is already known to the experienced exporter, the material, which is drawn from the experience of many successful exporters to Canada, will be of use to those who are tackling the market for the first time.

Dustproof Lighting Fitting

Intended for locations such as flour mills, where flameproof equipment is not necessarily required but where there is a need for a lighting fitting of robust construction that will protect the fluorescent lamp and its auxiliary gear from the surrounding atmosphere, the Mazda dustproof fluorescent lamp fitting consists of a cast aluminium alloy channel housing the gear tray, and a clear Perspex protecting cylinder enclosing the fluorescent lamp. The cylinder is detachable in order to simplify re-lamping. Produced by B.T.H., the standard fitting is designed for use with a single 80 W. 5 ft. fluorescent lamp, but similar units can be made to special order for use with 40 W. 4ft., 40 W. 2 ft., or 20 W. 2 ft. lamps.

For most industrial applications the end cap is supplied with conduit entry; suspension is by means of two adjustable straps round the back channel.

Recent British Standards

A revision of B.S. 836, Crude whale oil, published by the British Standards Institution in 1939, when it was not practicable to provide for all grades of good merchantable crude whale oil, has now been issued. This covers four grades of crude whale oil distinguished from each other by their volatile matter, dirt, colour, and acidity.

The standard gives details of the specification of each of the grades, as well as providing information regarding the sampling and preparation of the sample for examination. The methods of test have been brought up to date, and are included in the appendices.

The Institution have also recently issued revised editions of Section 14—Adhesive closing and sealing tapes, and Section 8—Wooden containers, to B.S. 1133:1950; a revised edition of B.S. 814:1950—Mild steel drums (light duty-fixed ends); B.S. 1702:1950—Mild steel drums (heavy duty-fixed ends); and B.S. 1262:1950, Part 2—Sizes of tins for paints and varnishes.

"The Medway Story"

Describing how multi-wall sacks are produced, a well-illustrated book published by Medway Paper Sacks, division of the Reed Paper Group, tells of the part played by the Group in pioneering this modern method of packaging and of the comprehensive packaging service developed by the firm.

The book attains a high standard in its presentation, and a special limited edition has been prepared, bound in leather. On application, Medway Paper Sacks will be pleased to send a copy of the book, bound in cloth, to responsible officials of firms interested in packaging in paper sacks.

Report on Tinplate Trade

The report on the tinplate trade, Census of Production Preliminary Report No. 114, recently issued by the Board of Trade, relates to establishments engaged wholly or mainly in the rolling from the bar or slab of tin, terne, and blackplate, and the production of tinned sheets and terne sheets, and which employed more than ten persons on the average during 1948.

Returns from all establishments on the register for this trade, which corresponds to minimum list heading 43(2) in the Standard Industrial Classification, have been compiled for inclusion in this report.

Any establishments in Northern Ireland are excluded in 1948; no production was recorded there in this trade for 1937 or 1935.

Tables given in the report, in addition to a general summary, cover stocks of finished products, etc., materials, and fuel in 1948; plant, machinery, and vehicles; new buildings acquired; and employment, wages, and salaries.

Crompton fluorescent lighting in the dough mixing room.

A Modern Bakery

Completely modernising their Coventry bakery, Suttons Bakeries, one of the Allied Bakeries Group, have installed additional travelling ovens and fully automatic bread-making machinery of the latest design. The new plant, housed in clean, cool, white-tiled rooms, provides an additional capacity of 2,000 loaves per hour.

New flow production methods considerably speed the process. Flour, conveyed from store rooms, is sifted, blended, weighed, and delivered to totally enclosed high-speed mixers. After mixing and fermentation, the dough is conveyed to a divider, where the correct quantity for each loaf is weighed. The dough pieces then enter a travelling prover where texture and quality is improved under controlled temperatures. After moulding, tinning up, and final proving in air-conditioned temperatures, the dough passes into travelling ovens for forty minutes' baking.

When it has cooled for approximately 5 hours, the bread is automatically sliced and wrapped, checked, sorted, and loaded to the company's fleet of electric and petrol vehicles for deliveries in the morning. Morrison-Electricar battery-electric vans deliver to local customers and a fleet of over fifty petrol-driven vans serves more distant localities.

The lighting installation, designed by Crompton Parkinson, helps to maintain maximum output and adds to the clean and attractive appearance of the entire bakery. Five-foot 80 W. Daylight fluorescent tubes in slotted top vitreous enamelled reflectors are used to provide 12 foot-candles (lumens per sq. ft.) on the working plane in the dough-mixing room. The proofing plant and oven room are lighted by the same methods, and similar equipment illuminates the despatch department.

Suttons are now installing Crompton fluorescent tube lighting in the cake and confectionery departments and in the new office block.

V-belting Drive Equipment

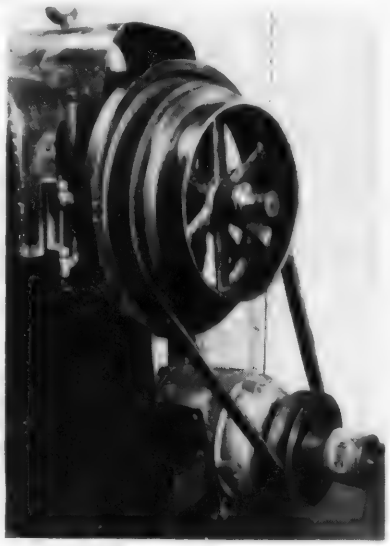
Specially developed for heavy duty drives, the new Mark 5 V-belt made by J. H. Fenner and Co. features a stronger cover, extra load bearing cords, more stiffness widthways, easier bending, and maximum uniformity in length.

Another item of equipment newly added to the company's range is a pulley, claimed to be the lightest cast iron pulley made in Great Britain, and designed to give the lowest possible ratio of weight to strength.

Also recently introduced, the Hainsworth variable speed pulley is a spring loaded one, embodying a patented arrangement of two coil springs which operate an equaliser. This ensures that each conical face is identically spring loaded and the belt remains in correct alignment in every position. It is simple to adjust and speed ranges up to 8 to 1 may be obtained; up to four belts can be used according to length of motor shaft. A variable speed pulley V-belt is made to run in conjunction with the pulley.

Constructed upon an entirely new principle, an efficient belting which has an unusually high co-efficient of friction when run on steel or cast iron pulley and which holds fasteners well has been introduced by the company. The length of the belting, which is known as Fenaplast, does not vary with changing atmospheric conditions; the load-bearing cords are manufactured from rayon and the belt is sealed together with a plastic material.

Moisture-resistant, non-inflammable, and clean, the belting is suitable for food conveyors as it does not taint food and can easily be washed down.



Hainsworth variable speed V-belt drive in operation.

Economic Engineering

The bulletin of the Institute of Economic Engineering, which contained typical news of regional activities, personal details covering membership, and indications of the Institute's extending activities in the field of industrial engineering, will no longer appear in its original form. In its place, a new monthly news sheet will be provided, in addition to the publication of a regular journal.

The first issue of this journal, *The Industrial Engineer*, contains some interesting articles on "Patterns in Organisation," "The Working Week," and "Simplification in British Industry," as well as book reviews and correspondence from members.

Discharger for flour and other finely ground materials.

New Bin Discharger

The discharge of flour and other similar finely ground materials from bulk storage can now be achieved without danger or difficulty by means of a new form of mechanical extractor.

There are 8 in. transverse slots at intervals across the width of the bin floor; specially designed metal "knives," attached at each end to driving chains, move slowly across this floor and in one action slice off and push the bottom layer of the material along so that it falls through the slots. These knives move one end at a time, the chains taking up the drive alternately, and each knife moves with a diagonal action on the principle of a lever.

The driving chains are operated by a spur gear, and the start of the movement of the chains takes place at the moment of maximum leverage, so that the force applied to start the metal knives moving is very great, thus enabling immediate action even if material such as flour has been allowed to stand.

The slotted bottom of the container is set at an angle so that the slicing action is downhill; the chains with their metal knives return along a level false bottom and sweep out the fallen material in a regular discharge, the rate of which is variable at will.

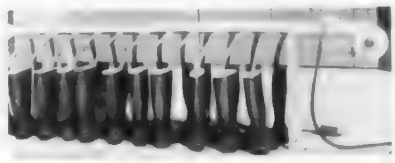
The discharger allows storage bins to be built with vertical sides, without hoppering, thus effecting a big saving of space. The material is discharged evenly and the level sinks regularly and without disturbance, so that, with most materials, the bins never require cleaning out.

Invented by Mr. Arnold Redler and marketed by the Bulkbin Company, the discharger can also be used to give mixtures of materials in any required proportion by arranging the bins in batteries.

Wellington Boot Drier

A cheap, safe, and rapid method of drying Wellington boots which have become wet inside due to operational work, accident, or perspiration is provided by the Secomak electric boot drier, which ensures the foot comfort of workers and can prevent much ill health caused by foot troubles.

The equipment consists of a modified blower to which is fitted a specially adapted version of a patent heater attachment. Air at the right temperature and pressure is blown through the heat insulated manifold and thence through ¾ in. rubber tubing into the toe of each boot. Drying times vary due to the state of the boots and atmospheric conditions, but an average is 30 minutes.



The drier needs no special attendance and its electricity consumption is negligible; it can be controlled by a hand-set automatic timer, if required. The blower motor is continuously rated universal for A.C. single phase or D.C.; standard ranges 230/250 volts and 200/220 volts.

Herring Processing Plant

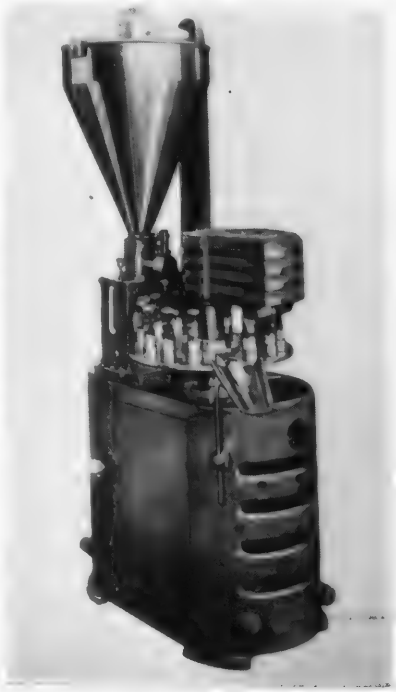
For some time past it has been the practice of the Herring Industry Board to take herring from the various Clyde ports and transport them overland to factories where they could be reduced to edible oil for making margarine and animal feeding meal. This was an expensive method, but one they were forced to adopt as there were no factories in the West of Scotland. The establishment of a new factory at Ayr to process on the spot herring landed from the Clyde coast in excess of the needs of the market for direct human consumption seemed to be the best solution to the problem, and the Town Planning Committee have agreed in principle to the establishment of such a plant on a site in North Harbour Street.

Versatile Tube Filling Machine

A new, fully automatic machine for filling, closing, crimping, and coding tubes is claimed to be equally suitable for a variety of lines or for long runs of one type only. Any material from a liquid to a stiff paste can be handled by choosing one of the three nozzle sizes provided with the machine, and tubes from ⅜ in. to 1¼ in. diameter and up to 7½ in. in length can be filled, as well as jars up to 8 fl. oz. or 218 c.c. A suck-back device prevents material from "hanging" on the nozzle and soiling the machine, and a mechanically operated device ensures that the machine cannot be soiled if the operator omits to fill a tube.

Two types of closing head can be supplied: one for two- or three-fold closure, the other for four-fold or saddle-back closure only, the saddle-back closure being particularly recommended. The machine is fitted with a 1 h.p. motor whose speed is adjusted to the needs of the user. A speed of 32-25/min. is suitable for medium-size tubes, ranging up to a maximum of 40/min. for small tubes. Five standard diameters of pump (14 mm., 22 mm., 30 mm., 40 mm., and 55 mm.) are available to fit all sizes of tube.

Known as the Kalix-Dupuy, the machine is of French design and manufacture and is available from the Flexile Metal Co., sole concessionaires for the U.K. and Commonwealth.



The Mayor of Dunstable inspects the new cafeteria.

Civic Cafeteria for Dunstable

A cafeteria for use on civic and social occasions has been presented to the Borough of Dunstable by the directors of Dunstable Showcases. Fabricated throughout in grey linette Formica, the cafeteria was made by apprentices of the company in its Houghton Regis factory and installed in the town hall.

The cafeteria was opened by the Mayor of Dunstable, Alderman T. Sandland, who was accompanied by the Deputy Mayor, Alderman A. W. Banks, Mr. F. Kenworthy, chairman of the Public Health Committee, and Mr. A. Bishop, senior sanitary inspector.

Scottish Canners' Problems

High costs and limited supplies of raw materials are causing concern in the Scottish canning and food processing industry.

The factory of Crosse and Blackwell, Peterhead, has been able to obtain from the north-east coast only half the 24,000 crans set as its target for 1950. Supplies were brought overland from the Forth and the Clyde, but such a practice affects the cost of production, and this firm, like other canners and processors, has been forced to give serious consideration to the future.

A large proportion of the herring canned at Peterhead goes to the U.S.A., but the deficiency in both fish and tinplate, and the higher costs operating at present, will make it difficult to hold the markets there. At times, tinplate shortages have become more serious than raw material shortages, and one estimate places output at only 50 per cent. of capacity during the periodic stoppages of can supplies.

Machines for Accurate Mixing

An effective approach to the problem of obtaining a consistently accurate mix when ingredients vary widely in specific gravity, grain sizes, and proportions, is provided by the latest models in the D.P. series of mixing machines manufactured by Foster, Yates and Thom.

The machines comprise a cube-shaped drum, mounted diagonally at a compound angle on trunnions, and rotated at a speed of approximately 10 r.p.m. The resulting action inside the drum prevents the ingredients from accumulating at the bottom of the mix, and effects uniform distribution of each constituent.

An interesting feature is the short mixing time cycle required for obtaining optimum results, achieved without causing harm to the ingredients either through attrition or pulverising. Where necessary impellers can be introduced, and these rotate in the same direction as the drum.

The drum can be easily and completely discharged for cleaning, either by removing the main lid, which is secured by quick-action swing bolts, and "inching" the drum into the position where two of its sides form a natural chute, or by means of a discharge valve set in the lowest corner of the drum. Cleaning has been simplified by radiusing all internal corners, and by making provision for the quick removal of the impellers when used.

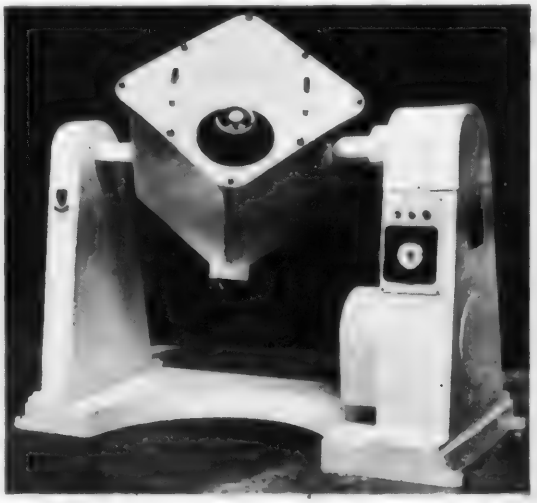
Models are available for laboratory and production purposes with charging capacities ranging from 10 to 700 litres. They can be supplied with the drums and impellers manufactured from a wide range of materials including stainless steel, and can be either in transportable form or made suitable for mounting in a fixed position on foundation columns.

Labelling Machines

To show the adaptability of their World labeller, demonstrations were given by Purdy Machinery Co. during the recent Packaging Exhibition on this fully adjustable hand-fed automatic machine which is fitted to apply labels to flat paper containers. The labeller is also widely used for the labelling of bottles, jars, tins, and cartons.

A different and improved principle is used on the New Way labeller, which is designed to deal with the all-round labelling of any cylindrical containers such as tins, bottles, or cartons. This machine was shown applying labels to cans. Economic for small or large outputs (up to 500 containers a minute), it is mounted on castors and easily transported in instances where the articles to be labelled cannot be brought to a central labelling station. The adjustments are few, and a complete changeover from one size to another may be achieved in two minutes without the use of tools.

For use where conditions do not warrant an automatic labeller, the Beatall label-gumming machine, motorised, was also available for demonstration.



Mixing machine which is rotated at a speed of approximately 10 r.p.m.

A.G.M. of Crisp Association

The chairman, Mr. C. F. Carlisle, F.S.A.A., and the secretary, Mr. W. Litherland, were both re-elected at the first annual general meeting of the National Association of Potato Crisp Manufacturers held recently at the Black Boy Hotel, Nottingham.

The chairman urged upon members the need for recruiting all possible manufacturers of good standing to strengthen the membership of the Association.

After the meeting, members joined an assembly in the board room of the Nottingham Chamber of Commerce to discuss oil supplies, retail prices, and standard trade terms.

Competing on a Higher Plane

At least one enterprising British firm are making sure that in her competition with America for world markets for machinery, Britain shall not lag behind in the provision of transport facilities.

The new warehouse of F. J. Edwards, situated at Park Street Works, Islington, which is now nearly completed, has been constructed with a flat-top roof to provide a landing place for helicopters. It is claimed that this warehouse will be the largest for machinery in the south of England and it is being equipped with two 20 ton overhead electrical travelling cranes, which will cover the whole of the building. Their blocks of offices in Euston Road also have a flat-top roof where helicopter landings can be made.

At their factory at Chard, Somerset, land for use as an air strip is available, and at their Loughborough factory landing facilities for aircraft are provided by a field which adjoins the works. The company are also planning a Birmingham machine centre which will offer the same facilities.

All-time Record for 1950

Over 185,000 vehicles and tractors were produced by the Ford Motor Company in 1950—an all-time record for the company, being 32,000 more than the previous record in 1948.

Consequent upon general rises in the cost of materials and components, and in particular of tyres, increases in the retail prices of the company's products took effect from January 20, 1951.

On cars and trucks the increases range from 2½ to 10 per cent.

OBITUARY

Mr. Hubert Napier Robson, sales director of James A. Jobling and Co. on December 28, 1950, at the age of 57.

From 1919 to 1927 he was a member of the sales staff of Cerebos, leaving that firm in 1927 to take up the position of sales manager to Suchards, chocolate manufacturers.

In 1929 Mr. Robson was appointed sales and advertising manager of James A. Jobling and Co., and he contributed much to the marketing and popularising of the Pyrex brand oven-glass and scientific glass-ware. He was appointed to the board as sales director on August 10, 1949.

For several years past he has been a member of the executive committee of the Glass Manufacturers' Federation, in which position his wide knowledge of the glass trade proved of great value to the trade in general.

*

Mr. Percy Good, director, British Standards Institution, and late President, Institution of Electrical Engineers, at the age of 70.

Mr. Good was a trustee of the Basic English Foundation, set by the Government in 1947 to propagate teaching and study of Basic English as an international and educational medium.

Erections and Extensions

A new egg processing factory is planned for construction at Whitehall Road, Drighlington, Morley, by Yorkshire Egg Products.

*

Extension of their potato crisp factory is being planned by James Martland, Ltd., of Mart Lane, Burscough, near Ormskirk, Lancs.

Plans have been prepared by Reading Co-operative Society for an extension of their bakery at Grovelands Road, Reading, Berks.

*

The premises of the Co-operative Wholesale Society at Waveney Drive, Lowestoft, Suffolk, are to be rebuilt as a new potato crisp depot and canning factory.

*

Plans for the erection of a new cold store at Western Avenue, Acton, London, W.3, have been drawn up by United Dairies.

Heated Food Containers

A solution to the problem of keeping food and beverages hot in an aircraft is provided by the electrically heated food container developed by G.E.C. and the Project and Development Branch of British European Airways.

Weighing 9 lb., the container consists of an insulated metal box 8 in. square and some 16 in. high, fitted with an electric heating element rated at 200 W. The stainless steel inner canister may be filled with either 12 plates of food or 1½ gal. of liquid. With the heating element switched off, the temperature drop does not exceed 9° F. an hour, and with the element on, the temperature rise exceeds 25° F. an hour. When used for liquids, a special tap is fitted.

These containers are to become standard equipment in all Corporation aircraft and more than 500 have been ordered.

Engineering Apprenticeship

The purpose of the booklet *Engineering Apprenticeship*, published by J. and E. Hall, is to provide some guidance to those who decide to take up engineering as a career, and to supply information on the standing of the firm, the prospects in the particular class of engineering with which it is concerned, and the scheme of training it provides.

The booklet traces the history of the firm since its foundation in 1785, and describes the present works of the company. An interesting series of illustrations shows apprentices engaged in various jobs in the different departments, and there is a collection of miscellaneous illustrations showing items of equipment manufactured and installations carried out by the firm.

Mould-resisting Cap Liner

Marketed under the name of Selexa, a new cap liner disc consisting of cork granules bonded together with a new tasteless and odourless synthetic resin laminated to a white polythene facing was included among the exhibits of The Metal Box Company at the recent Packaging Exhibition.

Experiments have shown that, with few exceptions, the cap liner is suitable for use with every single product normally packed in bottle or jar. In addition, it is hygienic, super-resilient, and specially made to inhibit the growth of mould.

Bulk Materials Storage Method

A new and up-to-date method of storing bulk materials which should have a wide application in many industries has been introduced.

The system employs independent units made of reinforced concrete to a special design which are placed side by side on any level surface without the need for attachment to the ground or to each other. Loads can be supported against either or both sides, simultaneously or separately.

A storage layout can be devised and quickly assembled for immediate use and whenever necessary be rearranged with the minimum of delay. Considerable saving in space can be achieved and storage capacity increased (by up to 170 per cent.) to a given area; materials can be separated and the stockyard kept in tidy and efficient order.

The units, which are 2 ft. wide, are made by Stelcon (Industrial Floors) in four standard heights, each in two strengths to accommodate different weights of materials. Special units are provided to form angles and intersections.

Road Haulage

In the January issue of Food Manufacture it was stated that Book Express, Ltd., had been notified of an increase in drivers' wages of 20 per cent. retrospective from October 28.

This was a misinterpretation of the communication from the Road Haulage Executive, the increase actually falling between 6·7 per cent. and 7·5 per cent., according to the previous rate of pay of the driver and the level of increase to which he is entitled under the recent award.

Irish Bakers' Meeting

At a recent group meeting of members of the British Baking Industries Research Association, carrying on business in Northern Ireland, Mr. A. I. McCann (Arthur McCann, Ltd.) was re-elected their representative on the Council for the ensuing three years.

The election took place after a meeting arranged by the Irish Association of Master Bakers at which a talk on "The Co-ordination of Breadmaking and Confectionery Recipes" was given by Mr. J. J. Devlin, senior bakery officer of the Research Association. Mr. Devlin dealt with the practical aspect of breadmaking and confectionery, and showed that there was a link between the numerous varieties of goods. Progression was traced from the basic bread dough to the fermented goods ultimately leading to batter goods, and cakes of the madeira type; an adjustment in the recipe led to sponge cakes. Finally meringues and almond goods were described, and the balance of the main recipes was considered.

In the ensuing discussion, questions were answered by Mr. Devlin and Mr. H. Hulse, senior scientific officer, on breadmaking faults and recipe balance.

Pickle in a Packet

An interesting innovation in the packaging of pickles takes the form of a transparent plastic film bag, holding a minimum net weight of 2 oz. of pickled onions or gherkins, but containing no vinegar. These dry pickles, introduced by Brother Bung Products, have been proved to have a shelf life equal to that of pickles packed in the ordinary manner.

Three dozen of the Pik-L-Paks go into each display carton, and their cheapness and compactness should considerably extend the field of use for pickles.

Marketing Homogenisers Overseas

An agreement whereby The A.P.V. Company have been granted the exclusive overseas distribution rights for Weir homogenisers has been concluded between that company and G. and J. Weir.

This arrangement will not affect Great Britain, where all home sales will continue to be handled as before.

Collecting Cards in Food Packs

Following the practice of the cigarette and tobacco trade, Joseph Lingford and Son began six years ago on the preparation of a set of British war leader cards (cigarette card size and shape) for inclusion in their food packs.

These cards have just been issued and it remains to be seen whether the urge to collect will popularise and increase the demand for a brand of custard powder or baking powder as it popularised certain brands of cigarettes before the war.

Magnetic Pioneers' Jubilee

In 1901 a drum-separator—carrying a yoke of electro-magnets for extracting ferrous from non-ferrous metals in scrap-yards—was first introduced by Rapid Magnetic Machines.

The company, who now manufacture a wide range of magnetic separating and lifting equipment for almost every industry, recently celebrated their golden jubilee with a large gathering of employees, their wives, and friends at a dinner and social evening at the White Horse Hotel, Birmingham. The occasion was also marked by the presentation of long-service awards to employees with 25 or more years' service with the company.

Some eighty different forms of magnetic separators, from tiny machines weighing a few pounds, for examining fine grains, to an 8 ton machine which removes iron from coal, are designed and manufactured, as well as heavy-duty lifting magnets.

It is in the extraction of "tramp iron" during processing operations in industries other than the metal trades that some of the most interesting developments have been made. The many materials which are treated for this purpose include foodstuffs such as tea, sugar, coffee, cocoa, cereals, and fruit juices; chemicals; and various other products.

How to Serve Ice Cream

Now more than a year old, Wall's Catering Information Service has taken over premises at 38, Queen Street, London, E.C., whereby it will be possible for the company to extend its facilities for the catering trade.

A pilot plant has been installed for the production of ice cream in experimental batches which will make possible the testing of new flavours. The research room also includes a built-in servery for making up experimental dishes and trying out new ideas and a cold running water well for cleansing ice cream scoops during service has been installed. The metal bowl of the well is fitted with a drain and overflow pipe and the water is constantly changing.

Adjoining this room is the research kitchen, which is fully equipped with the most modern plant and utensils. In this department new recipes are tested, dummy ice cream dishes are prepared for display purposes, and enquiries received from caterers throughout the country are investigated and answered.

Another room, devoted to the work of the tasting panel, contains five booths each fitted with a battery of different-coloured lights which ensures that all samples are identical in appearance, thus enabling the tasters to concentrate upon texture and flavour.

In addition to research and other work, the Service issues regular bulletins each of which contains a recipe supplement setting out ingredients and method of making up for a variety of ice cream dishes.

New Type Air Brush

An entirely new air brush which represents an outstanding advance in design and precision manufacture, ensuring perfect performance and long service, has been introduced by The Aerograph Company.

The company's air brushes have been in use for some fifty years; they provide a speedy means of executing all kinds of art work as well as the colouring and shading of drawings and plans.

The air brush atomises and projects water, oil, and spirit colours in the form of a fine spray by means of compressed air obtained from a foot pump; in cases where the instrument is in constant use, an electrically driven air-compressing outfit is recommended.

Wall's research kitchen, where staff experiment with new ways of presenting ice cream.

Register of British Manufacturers

Providing a substantial cross-section of important producers of British goods in a very wide range of industry, the *F.B.I. Register of British Manufacturers* is compiled and classified for quick reference with major instructions and cross-references in English, French, and Spanish.

A foreword by the President of the Federation of British Industries, Sir Robert Sinclair, K.C.B., K.B.E., is followed by a description of the organisation, its aims and activities, and overseas representation. The Register is having a world-wide distribution to importers, buyers, trade commissioners, and chambers of commerce, and should provide valuable support for the export drive.

Herring Atlas

An atlas giving a general picture of the distribution of the commercial herring shoals of the North-East Atlantic Ocean, with a note of the landing ports and quality, is now available to the herring trade. This publication has been issued under the auspices of the International Council for the Exploration of the Sea, which has for some time been devoting special attention to research into the problems of herring fishing.

Devised and edited by Dr. W. C. Hodgson, D.Sc., of the Fisheries Laboratory, Lowestoft, in collaboration with experts from the countries concerned with herring fisheries, the atlas contains 12 charts designed to show, for each month, the average distribution of the main herring concentrations in the North-East Atlantic area. This covers the fishings off the coasts of the British Isles, Iceland, the continental countries with North Sea seaboards, and the southern Baltic. Symbols are used also to indicate the condition of the herrings in the various fisheries, and throughout the atlas the explanatory notes are given in three languages—English, French, and Norwegian.

The atlas will be available for inspection at the Fishery Offices in Aberdeen, Anstruther, Ayr, Buckie, Campbeltown, Eyemouth, Fraserburgh, Lerwick, Lowestoft, Oban, Peterhead, Stornoway, Tarbert (Loch Fyne), and Wick. Copies will also be available at any local office of the Herring Industry Board.

Better Outlook for Sugar Plant

Scottish sugar machinery builders are overtaking the delivery lag in practically every type of plant.

In a report on exports to September 30 last, it was stated that demand has also expanded in the more recent months.

Export values increased from £2,200,000 in 1947/48 to £3,800,000 in 1949/50, thus overtaking some of the post-war arrears.

Orders on hand at March, 1948, were valued at around £5,500,000, but by the end of March, 1950, that figure had been reduced to £3,100,000. Although some of this reduction was due to expanded production, there was also the factor of increased European competition.

Inflow of new business has been around £2,500,000 per annum, while the last few months have shown an upward swing again, encouraging the belief that this average will be considerably increased in the full current year.

APPOINTMENTS

On the retirement of Mr. T. H. Clouston from the board of the A.P.V. Company, two new directors have been appointed. Mr. J. Matthews, B.Sc., manager of the dairy engineering department, is a well-known figure in the dairy industry. He is a past President of the Society of Dairy Technology, a former chairman of the Dairy Engineers' Association, and President of the Dairy and Ice Cream Association.

The other new director is Mr. Madron Seligman, B.A.(Oxon.), youngest son of Dr. Richard Seligman, founder and chairman of the company. Mr. Seligman is assistant to the managing director and a director of Paramount Alloys of Slough. He is in charge of the planning of the company's new factory at Crawley and later will be responsible for organising the transfer of the personnel and equipment from the four existing factories.

*

Mr. Felix L. Levy, who has for many years served on the board of the company, has been elected chairman and managing director of The New London Electron Works (one of the "600" Group of Companies) in succession to his father, the late Mr. Lawrence Levy.

A director of the parent company, George Cohen Sons and Co., and of five subsidiaries, Mr. Felix Levy was recently elected to the board of an associated company, Batchelor Robinson and Co.

Widely acknowledged as a leading authority on the ferrous and non-ferrous scrap industry, Mr. Levy is a member of the management committee of the National Federation of Scrap Iron and Steel Merchants, and of the executive committee of the London and Southern Scrap Iron and Steel Association.

Mr. W. Clarke, general manager of The New London Electron Works since 1943, has been elected to the board.

*

The Industrial Gas Development Committee, which was formerly a committee of The British Gas Council, will continue its work as a committee of The Gas Council.

Mr. H. R. Hems, industrial gas officer of the West Midlands Gas Board, and Mr. R. F. Hayman, of The North Thames Gas Board, have been elected chairman and deputy chairman respectively for the ensuing year. Miss M. R. Davies is secretary to the committee in succession to Miss L. Buckland.

The Commercial Managers' Committee includes among its functions the work of the former Domestic Development Committee of The British Gas Council. Mr. S. G. Aberdein, commercial manager of The North Thames Gas Board, is chairman, and Mrs. Eileen Murphy is secretary to the committee.

*

Mr. H. A. R. Binney, C.B., has been appointed director and secretary of the British Standards Institution in succession to the late Mr. Percy Good, C.B.E.

*

Mr. J. R. M. Simmons, forty-eight-year-old comptroller of the firm which he joined from Cambridge University twenty-seven years ago, is the fourth employee-director to be appointed by Lyons since the war.

*

The Earl of Verulam, M.A., F.I.I.A., J.P., has accepted an invitation to become an additional patron of the Purchasing Officers' Association. He is chairman and managing director of Enfield Cables, and is also chairman of Enfield Rolling Mills and of Sternol.

*

Mr. A. P. L. Blaxter, of Barnett and Foster, honorary treasurer of the Food Machinery Association, has been appointed to succeed the late Sir Harry Gilpin as chairman of the Association. Mr. Blaxter has for many years been chairman of an affiliated association, the Mineral Water Engineers' Association.

Mr. A. Graham Enock, of the Graham-Enock Manufacturing Co., has succeeded Mr. Blaxter as honorary treasurer.

*

Mr. L. H. Cooper has been appointed chairman and Mr. L. K. Brindley managing director of The Mond Nickel Company. Mr. G. Archer and Mr. A. Parker Hague continue as directors, and Mr. I. A. Bailey, Dr. L. B. Pfeil, and Dr. A. G. Ramsay have also been appointed directors.

*

Mr. William A. Palmer has been appointed a director of Huntley and Palmer with effect as from January 1, 1951.

Mr. Palmer is the elder son of Mr. Reginald H. R. Palmer, M.C., chairman of the company, and is the great-grandson of the late Samuel Palmer.

Brigadier J. V. Topham has been appointed secretary of the British Engineers' Association in succession to Sir William Christie, who resigned in January last.

*

After 21 years' service with British Sales, distributors of Del Monte foods, Mr. Stanley W. Brookes, has been appointed to the management of Carlton Foods, manufacturers of chicken noodle soup.

Mechanical Handling Developments

Several new designs in their range of mechanical handling equipment have recently been produced by J. Collis and Sons.

The first is a development of the telescopic model of their stacker. A manual hydraulic model was required with a self-discharging table, which had to be operated from the main frame of the machine, and not from the lifting table. A vital point was that the table must be capable of discharging its load at any height between 9 in. and 78 in. from ground level.

This feature was achieved mechanically by using a special lifting cable, and the shortening of this cable by the use of a lead screw and handwheel driven through bevelled gears made it possible to tilt the table at any height within the specified range. The whole of the tilting mechanism was mounted on a bedplate attached to the main frame, and rollers were fitted to the table to facilitate self-discharge.

Last year the company produced their powered RolaVeyor, a power-driven roller conveyor; they have now gone a step further, and have made the first spiral curve of powered RolaVeyor, designed to carry goods upwards.

Corrigenda

On page xvi of the February issue of FOOD MANUFACTURE there appeared a photograph of an installation of Butterfield's stainless steel equipment installed at the factory of H.P. Sauce Ltd. By a printer's error, it was described as "part of a recent illustration." This should have read "part of a recent installation."

*

On p. 76 of the February issue of FOOD MANUFACTURE, in a description of H. P. Bulmer's new cider mill at Hereford, the capacity was stated to be "1,000 apples a day" instead of "1,000 *tons* of apples a day."

BOOKLETS RECEIVED

A description of the packing of fruit in Pliofilm at Ditton Court Farm, near Maidstone, Kent, forms an interesting article in the winter issue of *Goodyear News*. An account is given of operations carried out, only the picker touching the fruit during its long but swift journey from tree to table. Each individual pack has a light cardboard collar which can be wire stitched to secure the fruit and provides an easy carrying handle.

*

When Planning Complete Chemical Plant is the title of a new folder by Bamag which summarises the complete installations supplied by that company to some 25 countries, including the U.S.A. Photographs of nitric acid plants in England and Spain, of a solvent extraction plant in South America, of a vegetable oil extraction and processing plant in Syria, a hydrogenation plant in India, an electrolyser in Ireland, and a continuous fat splitting plant, are among the many illustrations.

The folder is written in French, Spanish, and English.

*

Details of the latest types of their mercury-in-steel thermometers, for indicating or recording at a distance the temperatures in a wide variety of applications, up to 1,000° F. or 600° C., are given in a folder newly published by the Cambridge Instrument Company.

*

With the caption "Makes food fit for the Gods," a booklet recently published by Fredk. Boehm is devoted to the uses of monosodium glutamate, which, it has been said, "adds more chicken flavour to chicken, and more beef flavour to beef." A helpful table gives an indication of the quantities advisable to use with various meats, soups, canned vegetables, and other products, and a warning is issued against the addition of the product to certain foods. Methods of testing moisture and salt content and purity of monosodium glutamate are also described.

*

The first edition of the G.E.C. brochure on *Cold Pressure Welding* was published in 1948 and, owing to the novelty of the process, supplies of the publication were quickly exhausted.

Since then, however, much work has been done in the company's research laboratories on cold welding and a number of interesting variations of the basic technique have been evolved. The brochure has therefore been revised and reprinted, and now contains details of many new developments.

*

The uses of nickel-containing materials in industrial heat-treating and process equipment are described in a new issue of *Wiggin Nickel Alloys*.

A well-illustrated article describes the use of nickel equipment in the production of phenol-formaldehyde resins; another interesting item covers heat-resisting uses of the nickel-chromium-iron alloys. Examples are also given of the uses of Monel in the power and process industries.

OBITER DICTA

- If the public are not getting more on their plates it is not our fault, but somebody's bad management. — *S. H. Eva, chairman of the Pigs Marketing Board.*
- My stomach just stumbles through the week supported by the thought that next Sunday is never more than six days distant. — *Correspondent to the "Sunday Express."*
- If the Government produce the same results with fish as they have with coal, then Heaven help the people who depend on fish to augment their meat ration. — *Cyril Osborne, M.P.*
- My old cookery book states: Take 24 eggs, 3 lb. of flour, and 3 lb. of lump sugar grated, which will make 48 finger biscuits for a funeral. — *Correspondent to the "Sunday Express."*
- The semi-official Argentine newspaper *Democracia*, angry at the meat deadlock, calls Food Minister Maurice Webb "The Minister of Under-Nourishment."—*Correspondent to the "Daily Express."*
- Mr. Webb's theme song on assuming office of Food Minister was "A little of what you fancy does you good." Few of us realised just how little he meant.—*Correspondent to the "Daily Telegraph."*
- The only foodstuffs lacking are meats and fats, and the people could live infinitely better than Australians if they prepared vegetables properly. —*A. E. Smith, a former South Australian Federal M.P.*
- We do not get the evening promenade of the streets, with people walking about as they used to before the war. Those people walking about were the potential customers of the fish frier. —*Henry Morgan, President of the National Federation of Fish Friers.*
- The Ministry of Agriculture have just started to take a census of fruit trees all over Britain. After the census the Ministry will be in a better position to direct skilled bees to areas where they are most needed. — *Peterborough in the "Daily Telegraph."*
- Last year a young ex-Commando officer was nearly drowned by poachers, and he lost his trousers escaping. It was rumoured that when he reached the shore he was charged with being improperly dressed.— *Lieut.-Col. Boles, M.P.*

Chemicals Directory

Entirely revised and brought up to date, the new edition of *British Chemicals and their Manufacturers* is more comprehensive than the previous one and contains all the features of earlier editions which have proved useful to enquirers interested in obtaining supplies of chemicals and allied products.

The directory is issued every other year; the last edition was published in 1949, and it is proposed that the next issue will be in 1953.

Copies are available, free of charge, to persons or firms interested in the purchase of chemicals from the Association of British Chemical Manufacturers.

British Food Machinery

The first illustrated directory of its members to be published by the Food Machinery Association, *British Food Machinery*, contains three main sections—a list of members with their addresses and the names of their overseas agents; a classified index of members' products; and an illustrated section containing greater details of the products of many members.

The publication is being widely distributed to food machinery users at home and overseas, and a limited number of copies is available free of charge to manufacturers of food, foodstuffs, and beverages on application to the Association.

Cocktail Nuts

The packers of the cocktail almonds illustrated on page 61 of the February issue of FOOD MANUFACTURE are James Miller Food Products of Manchester.

COMPANY NEWS

A further issue of 900,000 4 per cent. redeemable cumulative preference shares of £1 each, ranking *pari passu* with the existing 600,000 such shares, is being made by H. J. Heinz Company.

▪

At the fifty-eighth ordinary general meeting of Allen and Hanburys, Mr. F. Capel Hanbury, the chairman, stated that the sales figure for the year was almost identical with that of the previous year. In the five months of the current financial year to November 1950, the export sales had increased by 58·5 per cent. over those for the corresponding period in 1949.

Net profit for the year was £72,602, and there was adequate cover for the present dividend on the ordinary shares.

A successful year's trading and continuance of a strong demand for the principal range of goods manufactured by the company were reported in the joint statement by the chairman, Mr. C. Bradshaw, F.C.A., and the deputy chairman and managing director, Mr. S. B. Hainsworth, F.T.I., at the thirteenth ordinary general meeting of J. H. Fenner and Co.

Of the many difficulties which the year brought, the greatest came from the evidence which accumulated to the effect that world prices of raw materials were rising steadily.

The policy of developing overseas markets had been vigorously pursued and the company had opened out a market in Canada for some of its products.

The directors recommended payment of a dividend on the preference shares of 5½ per cent., less tax, for the twelve months to June 30, 1950, and on the ordinary shares of 10 per cent., less tax, and a bonus dividend of 5 per cent., less tax.

Pest Expert visits Portugal

Problems of damage to food stores by pests in Portugal were investigated by Mr. G. V. B. Herford, director of the Pest Infestation Laboratory of the Department of Scientific and Industrial Research, Slough, during a three weeks' visit to that country.

During his visit, which was arranged by the British Council in conjunction with the Portuguese Ministry of Agriculture and the Portuguese National Fruit Board, Mr. Herford travelled throughout Portugal visiting storage depots and farms, and holding informal discussions with experts.

World Food News

Dutch Food Products

According to the Central Bureau of Statistics, the Netherlands production of foods in 1949/50 exceeded that of 1948/49 by about 20 per cent.

Meat production has shown a marked increase, owing to a larger amount of slaughter. Fruit production increased, but this was offset by the decrease in prices. The continued recovery of Dutch poultry stock resulted in greater egg production as well as a large number of table birds. Total dairy production was markedly greater than in the preceding season, although there was only a slight increase in values since milk prices fell.

A notable development is the building of a new plant at Wormerveer for the production of rolled oats.

Celebration at Naarden

The staff of the glycerin works of the company, the board of management, and many business friends both in Holland and from overseas, attended a ceremony held recently to pay tribute to Mr. E. van Loon, member of the board and managing director of the glycerin section, on his completion of twenty-five years' service with N. V. Chemische Fabriek "Naarden."

Dr. W. A. van Dorp, President of the company, spoke of Mr. van Loon's resourcefulness and his commercial capabilities, and attributed to him the raising of glycerin production to its present important place in the world market. After Mr. P. van Amelrooij, commercial assistant, had told some anecdotes about his career, Mr. van Loon addressed the meeting. He gave some practical advice to the younger members of the staff and also surveyed the development of glycerin production.

A number of presentations were made to Mr. van Loon, and the celebration concluded with a cocktail party.

Red Locusts in Tanganyika

Marshall Plan funds have been made available to purchase five turbine combine sprayer-duster machines needed to help prevent a plague of red locusts in the Rukwa Valley of Tanganyika.

These machines, which cost $12,661, are in addition to the $179,000 worth of American trucks that the Marshall Plan financed last October to aid in the fight against desert locusts which are threatening a widespread destruction of food crops throughout an area from India to West Africa.

The red locusts, which have been sighted in Tanganyika, are equally voracious; a plague of them, if allowed to spread, can last as long as 10 or 15 years.

Unlike the desert locusts, which are at present affecting North Africa, French Equatorial Africa, India, and Egypt, the red locusts concentrate farther south, blighting such areas as Northern and Southern Rhodesia, Tanganyika Territory, the Belgian territories of the Congo and Ruandi-Urandi, the Portuguese territories of Angola and Mozambique, and South Africa.

The International Red Locust Control Service, established by Great Britain, Belgium, South Africa, and Portugal to supervise areas in Central Africa which are known to produce swarms of these insects, has been successful in keeping down the red locust threat during the past few years.

Food Technology Course

Intended principally for those having some knowledge of the basic sciences pertinent to food technology, a three weeks' special course in food technology, from June 25 to July 18, is a feature of the 1951 summer session at the Massachusetts Institute of Technology.

To be given under the direction of Dr. Bernard E. Proctor, professor of food technology at the Institute, the intensive course will give particular emphasis to recent developments in food manufacture and control. In addition to lectures, demonstrations, and conferences at the Institute, there will be opportunities for group visits to representative food industries throughout Greater Boston.

The following subjects are among those on which the course will include fundamental material: eco-

nomics and statistics of food supplies; food cost accounting and business law; food bacteriology, sanitation, and fermentation; food chemistry and nutrition; materials handling; food packaging; labour relations; manufacturing equipment for new processes; food control instrumentation; flavour and food acceptance; and food sterilisation by electronics. Detailed studies of bakery operations, canning, food freezing, high-vacuum drying, brewing, meat packing, milling, yeast operations, and food specialities will be among several special food processing reports.

Norwegian Canning Industry

The Norwegian food canning industry is experiencing difficulty in obtaining sufficient tinplate, and restrictions on its use have now been introduced.

The Norwegian Ministry of Commerce has stated that requirements of tinplate amount to about 35,000 tons annually, of which 18,000 tons are required for the canned fish section of the industry. Prospects of meeting the industry's requirements during the coming year are poor, as Norwegian production is not large enough; and although tinplate is on the free import list, the possibility of importing it is limited in view of world shortages. It has been particularly difficult to obtain tinplate against dollars.

The restrictions now introduced are intended to ensure that there is sufficient tinplate available for packing the export production of the industry—brisling, sardines, herring, and other fish—and the restrictions have therefore been imposed on jam packers and other users of tinplate.

The market for Norwegian canned food is firm and good prices are being obtained. Exports in 1950 are expected to prove about 30 per cent. higher than in 1949. Only 270,000 boxes of sprats were canned in 1950 compared with 496,000 boxes in the previous year, and at the middle of December 757,000 boxes of smoked herring were packed, a little more than in the similar period of the previous year.

Irish Freeze Food Prices

The Government of the Republic of Ireland has frozen the prices of many manufactured and packed foodstuffs.

The price freeze extends to a large number of commodities, including bacon, cooked ham, and gammon; sausages and sausage meat; black and white puddings; all packed, canned, and bottled foodstuffs; dried peas; oatmeal; rice, sago, cornflour, and semolina; coffee and coffee preparations; biscuits; whisky; mineral waters; yeast; salt; bakers' compound; treacle; and honey.

The Order also applies to those commodities the maximum prices of which were already controlled. These include meat extracts; butter; margarine; prunes; seedless raisins; cheese; cocoa and cocoa preparations; condensed milk; flour; wheatenmeal and bread; jams and marmalades; tea; sugar; sweets and chocolates; wheat flakes; and beer (except lager).

A committee has been set up by the Government to advise the Minister for Industry and Commerce on applications for increased prices. Mr. P. J. Kavanagh of Kavanagh and Sons, Dublin, is a member of this committee.

Special powers include the power to close down the premises of persons offending against the Order.

It is understood that the Minister will not exercise his power to grant exemptions from the Order except in very special circumstances, and only after the fullest investigation of costings, accumulation of past profits, and the financial resources of the undertakings concerned.

A novel beer can.

Canned Beer Novelty

A unique beer can has been produced by the Acme Breweries of San Francisco, who were awarded the *Croix d'Honneur* for their new lager beer at the International Trade Exposition in Brussels.

The original feature of their Gold Label Beer can is its resemblance to a glass of beer, showing bubbles rising up to a rich, creamy-looking head at the top.

Tinplate Shortage in Ireland

POSSIBILITIES OF ALTERNATIVE PACKS

The effects of the shortage of tins and tinplate, which has become acute in Ireland in the last few months, now make it more than ever necessary to consider the possibilities for greater use of alternative containers wherever possible.

One firm, W. and R. Jacob and Co., Dublin, were on half production at the beginning of this year, so seriously was their output curtailed by lack of tins, although appeals to traders to return empty containers and cases to the factory quickly were successful.

For some time now the industry has had to be satisfied with any package, as the possibility of meeting needs solely from the sterling area is very uncertain, and improved supplies from dollar sources are considered unlikely.

Irish metal manufacturing concerns such as Ashtown Tin Box Co., Dublin, and the Metal Box Co., Portadown, are doing their best for firms other than cooked food manufacturers, but are forced to ration strictly. One food concern that normally uses 100,000 tins a week was allocated only 150,000 for the first three months of 1951. If the shortage continues, and the prospect does not improve, production may have to be cut in many factories.

A changeover to a new pack is costly, and glass, which is a cheap and obvious alternative in Ireland, does not suit all products; even where this is used, tin is still needed for capping containers.

The question of using paper containers has been considered. Fresh frozen foods, a beef extract, and a chocolate spread are among the products being packed this way, but the fact remains that for certain foods, tin remains the only satisfactory pack.

Manufacturers in Ireland are at present awaiting further developments before they plan any big change in production to offset the shortage of tins.

International Meat Congress

The International Meat Traders' Congress is to be held this year at the beginning of May at Spiez on Lac Thun, Switzerland. At the same time the school for the meat trade, which has been established there, will be officially opened.

Food Hygiene in Ireland

Food hygiene regulations, designed to ensure cleanliness in the preparation, handling, and sale of foodstuffs, came into operation in Ireland in February.

Drawn up by the Department of Health, the regulations are being enforced by the health authorities through their medical officers and health inspectors and through the veterinary inspectors of the sanitary authorities. Permanent health inspectors have attended a course in the theory and practice of food hygiene conducted by Dublin Corporation, as they will have the responsibility of inspecting and reporting on food premises.

Sugar Rebate

Confectionery manufacturers and makers of all products in Ireland containing sugar who obtained a rebate in January, 1951, of a ½d. per lb. on sugar used retrospective to November 1, 1950, and 1d. per lb. for the period from October 8 to November 1, have now been told that the rebate will also apply to future exports.

The rebate is paid by the Irish Sugar Co. on receipt of an official British form certifying the importation of products and the percentage of sugar contained in them.

The reason for this is that on October 3 last the wholesale price of unrationed sugar (the Irish ration is 12 oz. per person, but unlimited supplies are available at 8½d. per lb. retail) was raised from 65s. 4d. to 74s. 8d. per cwt., only to be reduced again on November 1 to 70s.

The increase was imposed because, while dollars were being paid for imported sugar, an equivalent amount of Irish beet sugar was being exported in manufactured products for sterling at a lower price.

Representations by the manufacturers resulted in the price increase being halved. Some manufacturers found that, even after the reduction, they were unable to compete, and the rebate system now in operation was introduced.

Butter Production

Owing to the unusually high production of butter in the Republic of Ireland during 1950, and lack of sufficient cold storage accommodation, advantage was taken of favourable markets to export 400 tons of butter in March, and again some 2,250 tons in the autumn.

Since then bad weather has resulted in production being lower than for the corresponding period in 1949, and to enable full requirements to be met between now and the end of April, 1951, when production will again overtake consumption, arrangements have been made to import Danish and New Zealand butter, the first consignment of which amounted to 500 tons.

American "Laboratory Oven"

With the help of a rotary "laboratory oven," the food and bakery technologists of the U.S. company, General Mills, Inc., test the baking quality of wheat flour.

Designed to hold twelve ¼ lb. loaves of bread, the oven has a horizontally turning table that makes three revolutions a minute; it therefore keeps the bread moving around the baking chamber, eliminating the effect of "hot spots" that may occur even in a well-regulated oven.

Ministry for Czech Food Industry

The Czechoslovak Government has recently established a new Ministry of Foodstuff Industry to take over the work of the Ministry of Food in respect of food manufacture and allied production. Mrs. Ludmila Jankovcová, the present Minister of Food, has been appointed head of the new department.

The remaining work of the Ministry of Food passes to the Ministry of Internal Trade.

British-made in U.S.A.

Major-Gen. G. P. B. Roberts, a director of Scribbans-Kemp, recently arrived at Idlewild for the opening of the merchandising programme of his company's American subsidiary, Scribbans-Kemp (U.S.A.).

This is the first time that a British food product has been marketed in the U.S.A. on a mass basis in competition with American products through chain stores.

Sugar in Switzerland

A blueprint for the setting up of a second sugar factory in Switzerland is likely to be presented in the course of this year, the director of the Agricultural Department of the Swiss Ministry of Economics told a meeting of the Association of Swiss Farmers. This announcement means that the Swiss Government is now supporting the request of farming circles for an increase in the area under sugar beet in Switzerland.

Commercial and industrial circles are strongly opposed to such action, as the existing factory is competitive only because of a heavy import duty on foreign sugar; they maintain that a further expansion of Swiss sugar beet and sugar production will result in a reduction in sugar imports and an increase in domestic sugar prices.

Transparent Cans for Seafood

A recent innovation in packaging is the use of a printed acetate-bodied can for such raw frozen products as oysters, crabs, and several kinds of fish, including fillet of sole, cod, and rockfish, by Airfresh, Inc. Seattle.

In view of the perishability of such seafood, this pack has considerable merchandising appeal as it permits complete visibility.

The sheet material used for the container is unpolished 0·015 extruded acetate. Seaming is effected with a solvent adhesive that not only holds the can edges together but, dissolving into the acetate, virtually forms a weld. The cans are provided with conventional crimped-on metal ends.

No trouble has been experienced with water-vapour loss or from the effect of light on the frozen products. As the contents are frozen immediately after packing and kept frozen, there is no question of liquid leakage at the point where the metal ends are crimped to the metal body.

Award for Work on Vitamins

For making possible the production of vitamins A and E from waste materials, Dr. Kenneth C. D. Hickman was recently awarded a John Price Wetherill medal by the Franklin Institute.

In addition to his work on vitamins, Dr. Hickman was cited for the great part he had played in developing improved means in producing high vacua by the use of oil diffusion pumps and for significant advances resulting from the design of the centrifugal still.

Pakistan Sugar Mill Opened

Described as the biggest sugar mill in Asia, the Premier Sugar Mills recently opened at Mardan by Khwaja Nazimuddin, Governor-General of Pakistan, are expected to be able to produce 50,000 tons of sugar per annum when operations are in full swing.

During his speech, the Governor-General stated that there was further scope for the establishment of sugar mills in the country. The Government had given permission for the establishment of a sugar mill in Bahawalpur State, and the question of establishing another mill in Thal Area in the Punjab was under consideration.

German Canned Meat Exports

The first important post-war export shipments of German canned meat have now been made. Although a few small deliveries had been made earlier to foreign customers under barter arrangements, it was not until the end of 1950 that the first large export contracts, covering the delivery to Britain of 600 tons of canned hams and canned shoulders, were concluded. Further shipments can be made as the German Food Ministry has already freed additional quantities for export.

German meat canners are particularly keen to obtain foreign orders in view of the fact that domestic sales are insufficient to enable them to operate at full capacity. Moreover, export sales are made almost exclusively in high quality, relatively expensive products, and the proceeds can be used to import lower quality meat products which have a larger sale on the domestic market. Really large-scale export business, however, can be expected only when shipments to the U.S. are resumed.

Armagh's Apple Industry

DEVELOPMENT OF CIDER AND CANNING FACTORIES

Industrialisation in recent years has brought a new prosperity to the county of Armagh, Northern Ireland, where the tradition of apple growing dates back to the 17th century.

A canning factory which started operations some months ago is expected to absorb larger quantities of locally grown apples as soon as it gets into full production. At present it has a weekly output of 75,000 lb. of canned apples although lack of cans, which are severely rationed, is a restrictive factor.

The fruit is bought peeled and unpeeled and is steeped in brine overnight to harden the flesh and preserve the colour. It is then steamed and canned, after which follows the usual routine of sterilisation, labelling, and packing.

Cider factories throughout Northern Ireland also absorb much of Armagh's fruit, and Mr. Noel P. Girling, organiser of the Northern Ireland Fruitgrowers' Association, hopes that his recent visit to London will result in the establishment of another cider factory at Portadown, Co. Armagh. An English firm is interested in the project and has already agreed to give preference to the fruit offered by members of the Northern Ireland Fruitgrowers' Association.

Armagh, with its rich limy soil and sheltered hillsides, is considered eminently suitable for apple cultivation, and settlers, who came from Scotland and England after the Plantation of Ulster in 1609, realised its possibilities. Such varieties as "Sugar Sweets," "Strawberry Cheeks," Honeycombs," "Widow's Whelps," "Barnhills," and "Dockings," dating from that time, are still grown.

Covering some thousands of acres, the orchards bring in an average yearly income of over a million pounds to growers, but it is believed that there is still tremendous room for expansion. Modernisation of the industry did not begin until about 1912 when fruit spraying was started, the Armagh Agricultural Committee purchasing a hand-operated machine, which was loaned to growers at 2s. 6d. a day. Twenty-five years ago the first motor-driven sprayer was introduced and today there are over 500 of these in use eight times a year to keep pests such as Winter moth, Red Spider, Saw Fly, Apple Sucker, and Capsid Bug under control. Although old in tradition Armagh has been slow in introducing up-to-date methods of apple cultivation.

The bulk of the crop is shipped to canners, jam manufacturers, and fruit wholesalers in England and the great reputation the county has for quality is preserved by a severe grading system. To be passed as first class a box of apples must be completely undamaged, the skins clean, and apples at least 2¼ inches in diameter. The examination takes place before the consignment is loaded on to the boat at Belfast, and as much as six or seven tons have been rejected because of two or three badly graded boxes. If an exporter has more than three loads unaccepted in a season his licence is cancelled.

Up to 30s. a box was paid for a 50 lb. box of Bramleys during the war years, but competition from foreign markets has now brought prices down to about 10s. for similar boxes. Northern Ireland growers have made repeated demands to the British Ministry of Food through their own Ministry of Agriculture for protection from these imports, but the reply has been that growers should have no difficulty in finding lucrative markets for Bramley seedlings which are considered to surpass in flavour and texture those grown abroad.

Although the county is famous for Bramleys, other varieties include Grenadiers, Beauty of Bath, Blood of the Boyne, No Surrender, and Lord Derby. Apple picking may not, perhaps, be considered a skilled job, but growers say it pays them to employ experienced hands during the picking season, notwithstanding the difficulty in obtaining them. Apples pulled roughly or cut by fingernails deteriorate rapidly, so will not be accepted by factories, and ladders scraped along the tree branches have been known to destroy the next year's buds.

The Ministry has encouraged the planting of orchards in every possible way. Constructive development of the industrial side was interrupted during the war, but the past few years have seen great progress made in the provision of factories in the fruit-growing districts of Armagh. If successful, they should be capable of ensuring that "The Orchard of Ireland" will enjoy continued prosperity.

OVERSEAS ENQUIRIES

Egg Handling Machinery

The United Kingdom Trade Commissioner at Brisbane has advised that the South Queensland Egg Marketing Board of Cr. Makerston Street and North Quay, Brisbane, are anxious to obtain information about United Kingdom egg handling equipment, especially that of a mechanical nature. In particular, a machine is required for grading, testing, stamping, and oiling eggs, as well as machines for use in connexion with pulping and processing eggs, including the extraction of the contents from the shell by suction or other methods.

It is suggested that United Kingdom manufacturers of mechanical equipment of the type required at present or of a type that might be of a future interest should write direct to the Marketing Board quoting prices and delivery dates and enclosing any available literature.

*

Biscuits and Preserves

The United Kingdom Trade Commissioner for the Maritime Provinces and Newfoundland at Montreal has reported that Baine Johnston and Co., Ltd., of St. John's, Newfoundland, are desirous of acting as distributors for United Kingdom foodstuffs, including biscuits, chocolate bars, preserves, jams, and similar products.

Firms interested in this enquiry should forward quotations c.i.f. Canada direct to Baine Johnston and Co.

Chicago Food Exhibition

British producers of food products and food equipment have been invited to display their goods at the International Food Exhibition to take place in Chicago in June, 1951.

The exhibition, in which representatives from all Marshall Plan countries have been asked to participate, is to be held under the auspices of the National Association of Retail Grocers of the United States. Types of goods to be exhibited will be food and other products normally sold in grocery stores, and retail grocery store equipment; no food manufacturing equipment will be shown.

The food exhibition will be held concurrently with the business sessions of the Association and foreign exhibitors will be invited to attend these meetings. Industry and government leaders will address the convention on matters of interest to the food industry; subjects for presentation and discussion include efficient food presentation, new methods of merchandising, departmentalising in a food store, personnel training, trade practices, the supply outlook, operating costs, and departmental problems.

Further information may be obtained from Miss R. M. Kiefer, Secretary-Manager, National Association of Retail Grocers, 360 North Michigan Avenue, Chicago 1, Illinois, U.S.A.

Utrecht Industries Fair

Some forty-eight branches of industry will be represented at the International Utrecht Industries Fair to be held from April 3 to 12. Products of twenty-two of these branches will be shown at Vredenburg; exhibits of the remaining groups, including machinery, raw materials, and means of transport, will be on view at the Croeselaan grounds.

News from the Ministries

Increased Fats and Oils Prices

The increased costs of raw materials have made it necessary to raise the prices of edible fats and oils supplied to manufacturers and trade users and of dripping as from January 28, 1951. The prices of margarine and cooking fat sold for the domestic ration are not affected.

The Oils and Fats (No. 2) Order, 1949, has been amended accordingly.

Milk Distributors' Margins

Because of substantial cost increases since milk distributors' margins were last reviewed, the Ministry of Food has decided to increase the retail milk distributors' margins by ¼d. per gallon. He has accordingly made The Milk (Control and Maximum Prices) (Great Britain) (Amendment) Order, 1951, reducing the wholesale prices of all types of milk other than sterilised by ¼d. per gallon. Although the Order took effect from February 1, 1951, the Ministry's first-hand selling price for milk was reduced from January 1, 1951, and dairymen buying from wholesalers or depots should look to their suppliers to make the necessary adjustment in prices as from that date. Producer-retailers will receive an appropriate increase in their Government grant.

As from January 1, the remuneration paid to wholesalers who heat-treat and bottle milk on the same premises in accordance with conditions laid down by the Ministry will be increased from 2¼d. to 2¾d. per gallon. The rate for sterilised milk will remain at 2½d. per gallon. Increases in the rates of handling allowances payable to depot proprietors will be announced later.

The price of milk to the consumer is not affected by these changes.

Imports of Sugar-fat Mixtures

As from February 1, certain sugar-fat mixtures may be imported without restriction from the usual "liberalisation" list of countries. The technical descriptions of the existing fruit juices and mincemeat which may be freely imported from these countries are also changed.

This unrestricted import is permitted from all countries other than the following:

Albania, Argentina, Bolivia, Bulgaria, Canada, Colombia, Costa Rica, Cuba, Czechoslovakia, Dominican Republic, Ecuador, El Salvador, French Somaliland, Germany (Russian Zone), Guatemala, Haiti, Honduras, Hungary, Iran, Japan, Korea, Liberia, Mexico, Nicaragua, Panama, Philippines, Poland, Roumania, Tangier, Union of Soviet Socialist Republics, United States of America, Venezuela, Yugoslavia.

Oils and Fats

The Oils and Fats (No. 2) Order, 1949, has been further amended with the following effects:

1. Licences are no longer needed to sell by wholesale oil seeds and oils and fats other than cooking fats, margarine, and lard.

2. Neat's-foot oil, castor seed and castor oil, niger seed and niger seed oil, rapeseed and rapeseed oil, and perilla seed oil are freed from all restrictions on processing and use.

3. Cocoa butter may be obtained by trade users without a permit.

Working Party on Grain Storage

The extensive and increasing use of combine harvesters in the United Kingdom has created a serious problem as regards drying and storage of the large amount of grain harvested by these machines. The Minister of Agriculture and Fisheries, the Minister of Food, and the Secretary of State for Scotland have, therefore, decided to set up a small Working Party on this subject under the chairmanship of Mr. George Brown, M.P., Joint Parliamentary Secretary to the Ministry of Agriculture and Fisheries.

The Working Party will consider the extent to which existing drying and storage facilities need to be supplemented, and will make recommendations on any further action necessary by farmers, traders, users of grain, or the Government, bearing in mind the high production of cereals now called for by national policy.

Preservatives and Colours in Food

The Food Standards Committee, appointed by the Minister of Food in January, 1948, has set up a Sub-Committee with the following terms of reference:

> To review the Public Health (Preservatives, etc., in Food) Regulations and to make any recommendations the Sub-Committee may consider desirable for the amendment of the Regulations.

The Sub-Committee includes members representing the Society of Public Analysts and Other Analytical Chemists, the Society of Chemical Industry, the food manufacturing industry, the Medical Research Council, the Ministries of Food and Health, the Department of Health for Scotland, and the Department of the Government Chemist.

The following have agreed to serve on the Sub-Committee:

Professor E. C. Dodds, M.V.O., M.D., D.Sc., F.R.C.P., F.R.I.C., F.R.S., director of the Courtauld Institute of Biochemistry (chairman).
C. A. Adams, C.B.E., B.Sc., F.R.I.C.
N. R. Beattie, M.D., D.P.H.
P. N. R. Butcher, C.B.E.
Professor S. J. Cowell, M.B., F.R.C.P.
H. E. Cox, Ph.D., D.Sc., F.R.I.C.
A. Glover, M.Sc., F.R.I.C.
E. B. Hughes, D.Sc., F.R.I.C.
J. M. Johnston, M.D., F.R.C.S. (Edinburgh).
J. R. Nicholls, C.B.E., D.Sc., F.R.I.C.

Mr. Adams, Mr. Butcher, and Dr. Johnston are also members of the Food Standards Committee.

Messrs. B. W. Smith and W. A. Godby, M.B.E., A.R.I.C., have been appointed joint secretaries of the Sub-Committee.

The Sub-Committee will consider technical and scientific data bearing on the use in foods of preservatives, colouring matters, dyestuffs, and allied substances such as antioxidants, anti-staling agents, anti-mould agents, stabilising agents, and emulsifying agents. The views of research associations, food processing firms, and medical and technical associations will be invited both as regards the interpretation and the limitations of the present regulations. Any person or organisation able to assist with information on these matters is invited to write to the secretary of the Sub-Committee at the offices of the Ministry of Food, Food Standards and Labelling Division, 47, Portman Square, London, W.1.

Soft Drinks Order Amended

The Soft Drinks Order, 1947, has been further amended to allow the sale of orange squash made from whole fresh oranges which have been comminuted (reduced to fine particles), with a minimum quantity of added sugar and a maximum quantity of saccharin.

To be suitable for consumption without dilution the drink must contain not less than 5½ lb. of comminuted entire fresh oranges, 18 oz. of added sugar, and not more than 82 grains of saccharin per 10 gallons.

If intended for consumption after dilution it must contain not less than 27½ lb. of comminuted entire fresh oranges, 7½ lb. of added sugar, and not more than ⅞ oz. of saccharin per 10 gallons.

Cocoa Butter

Following the decontrol of raw cocoa on November 1 last, cocoa butter was freed from price and other controls with effect from January 10, 1951. The necessary amendments have accordingly been made to the Chocolate, Sugar Confectionery, and Cocoa Products Order, 1949, and the Oils and Fats (No. 2) Order, 1949.

The rationing of chocolate confectionery and the existing controls over the prices of chocolate confectionery and other cocoa products continue.

Food Production Council

A National Council for Domestic Food Production, under the chairmanship of Mr. George Brown, M.P., has been appointed by the Minister of Agriculture and Fisheries to co-ordinate the work of the various national organisations engaged in domestic food production in England and Wales, to consider measures for its development and encouragement, and to examine and advise on any proposals for Government assistance, financial or otherwise, and generally to advise the Minister in the national interest on all matters relating to domestic food production.

Sales of Milk Powder

As supplies of milk powder have improved, some of the restrictions on distribution have been relaxed and prices on sales by traders have been decontrolled as from January 14, 1951; these changes do not affect National Dried Milk or the proprietary brands of infant milk foods. From the same date, the Ministry's selling price for all types of milk powder has been revised.

Details of relaxations of control are as follows:

(*a*) *Distribution:* The allocation system has ended and there is no restriction on the sale or use of milk powder, except that manufacturers of animal feedingstuffs compounds will continue to obtain supplies only on presentation of the appropriate ration documents.

(*b*) *Decontrol of Prices:* The Milk Powder (Maximum Prices) Order, as amended, has been revoked from January 14, 1951, to give effect to the decision to free sales of milk powder by traders from price control.

The revised Ministry selling prices (including sales by Milk Powder Pool, Ltd.), which are "ex store" instead of "delivered," are as follows:

	Per Cwt. ex Store
	s.
Spray full cream	193
Roller full cream	183
Spray skim	98
Roller skim	84
Spray buttermilk ...	70
Roller buttermilk ...	65
Spray whey	70
Kraft whey	50
Roller whey	50

Traders who need deliveries larger than 20 cwt. may apply to the Milk Powder Pool, Ltd., Ministry of Food, London Road, Stanmore, Middlesex.

Standards for Ice Cream

IMPROVEMENT IN COMPOSITION

The Food Standards (Ice Cream) Order, 1951, prescribing minimum standards of composition for ice cream, has been made.

The Order provides that ice cream must contain at least 5 per cent. fat, 10 per cent. sugar, and 7½ per cent. milk solids other than fat. For ice cream containing fruit the content of non-fatty milk solids may be reduced, but the total content of fat, sugar, and milk-solids-not-fat must be at least 25 per cent. with minimum contents of 7½ per cent. fat, 10 per cent. sugar, and 2 per cent. milk-solids-not-fat; the manufacturer is thus free to increase the content of one or more of these ingredients at his discretion to reach the 25 per cent. minimum total content. Because of the Jewish dietary law which prohibits the consumption of milk and meat at the same meal, a minimum standard of 10 per cent. fat and 14 per cent. sugar with no milk solids is prescribed for Parev (Kosher) ice.

It is intended that the standard shall apply to any products (including those supplied in catering establishments) which are sold as "ice cream" or "ices," including products where either of these descriptions is qualified by the mention of a flavour, such as "coffee ice." The standard is not intended to apply to water ices sold as such, or to "ice lollies."

Sugar is defined as sucrose, invert sugar, and the solids of sweetening materials derived from starch (such as commercial glucoses), but the ice cream must contain at least 7½ per cent. sucrose.

To allow reasonable time for the disposal of existing stocks of ice cream powder mix, which may produce ice cream which does not comply with the standard, the Order will not come into operation until March 1, 1951. Nevertheless, as a result of the recent increase of allocations of fat and of milk powder, many manufacturers are already producing ice cream complying with the standard.

In making the standard the Ministry has had regard to the recommendations of the Food Standards Committee and to the representations which were received after the publication of the Committee's proposals last July. The Ministry wishes to make it clear, however, that it regards the standard as an interim one which can be improved as supplies of ingredients become more plentiful.

It has been represented that provision should be made for a standard weight per gallon of ice cream because of the wide variation in the volume of air incorporated in ice cream. The Food Standards Committee has suggested that this question should be further examined when the interim standard is reviewed.

Cereal Fillers

An Order replacing and consolidating, with amendments, the Cereal Fillers (Control and Maximum Prices) Order, 1944, and its amending Orders, has been made.

The principal changes effected by the new Order, which came into force on January 21, 1951, are:

(*a*) licences to manufacture cereal fillers are no longer needed;

(*b*) the maximum price of cereal fillers on sales to a retailer or manufacturer and on sales by retail is increased to £45 15s. per ton, and on any other sale to £37 15s. per ton;

(*c*) there is no longer a specified limit to the amount which may be charged by a seller on sales other than to a retailer, to a manufacturer, or by retail, in respect of "the reasonable and actual costs" of transport from the premises on which the cereal filler is manufactured.

Home-grown Linseed

Linseed oil can now readily be obtained from soft currency areas overseas and it is no longer necessary to call on home farmers to make special efforts to grow linseed. The Minister of Food has accordingly revoked as from January 21, 1951, the Home-grown Linseed (Control) Order, 1948, which controlled the sale of linseed so as to ensure that the largest possible quantity was sold to the Ministry of Food for crushing.

Growers may now sell their linseed to whom they please. Until June 30, 1951, the Ministry of Food will continue to buy on the present basis of £55 per ton for seed of 90 per cent. purity linseed of the 1950 or earlier crops offered to it. Feedingstuffs coupons will still be issued in the ratio of 12 cwt. of linseed cake to each ton of clean linseed from the crops mentioned which are delivered to the crushing mills for the Ministry or sold for sowing through merchants formerly licensed as approved buyers of linseed. It is emphasised that only these classes of sales will qualify for the issue of feedingstuffs coupons. Until June 30, 1951, therefore, growers who sell to merchants and wish to receive the coupons should secure a written undertaking that their linseed will be sold only to the Ministry of Food or for sowing.

After June 30, 1951, the Ministry of Food will always be willing to buy home-grown linseed at prices related to those which it is, at the time, prepared to pay for imported linseed or linseed oil, but there will be no further issues of coupons for linseed cake against such purchases.

This relaxation of control over home-grown linseed does not extend to linseed cake or meal, which will continue to be subject to rationing and price control.

Prices of Bacon for Canning

An Order amending Part II of the Second Schedule to the Bacon (Control and Prices) (Amendment) Order, 1950, has been made.

The effect of the amendment is to increase the maximum wholesale prices (which are unsubsidised prices) paid by canners for gammons and fores. The new prices are as follows:

	Maximum Wholesale Price Per Cwt. s. d.
Unsmoked gammons ...	322 6
Smoked gammons ...	338 6
Unsmoked fores ...	253 6
Smoked fores ...	271 6

Dried Fruits

The Dried Fruits Order, 1951, which came into force on January 14, 1951, consolidates, with amendments, the Dried Fruits Order, 1949, as amended. The principal changes are:

1. The maximum prices of currants, raisins, and sultanas are increased at all stages of distribution to take account of the higher prices which have had to be paid for these fruits.

2. The restrictions on the use of dried fruit in the manufacture of vegetarian products and British wines are removed, but a permit will still be needed to obtain supplies.

3. Mincemeat is redefined as a mixture of fresh or dried fruit with other ingredients commonly known as mincemeat.

Information and Advice

Processed Cheese

B.4861. *Can you give me a recipe for the manufacture of processed cheese?* (S.W. Africa.)

Processed cheese is a product made by blending different lots of cheese with the aid of heat and an emulsifying agent. Cheese of varying degrees of ripeness, or too low fat content, or too high moisture content, or those having an off-flavour, etc., can be made marketable by processing.

Cheddar, Swiss, Limburger, Brick, and Camembert varieties may be processed. Usually about 10 per cent. of old, well-ripened cheese is mixed with others 4 to 7 months old in order to give the finished product a desirable flavour. Considerable skill is needed to select cheese of the proper age and to regulate the manner of processing.

Generally, the first step in the processing is to clean the surface and remove the rind. About ½ per cent. of common salt may be added. A small amount of emulsifying agent (up to 3 per cent.), is dissolved in water and added to the cheese. Sodium citrate, ammonium citrate, disodium phosphate, and Rochelle Salt are among the most commonly used emulsifying agents. Their use gives the cheese a plastic body and prevents the fat from separating during the processing operations.

The mixture of ground cheese, emulsifier, and water is heated to about 150° F. and stirred constantly until the desired consistency is reached. The hot, plastic mass is run through a special filling machine usually into containers lined with metal foil or moisture-proof paper. These are filled and sealed in such a manner that the package is airtight and the product will keep for a long time without mould development.

Jam Preservation

B.4896. *Can you tell us if there is any special method or requirement for keeping jam in exceptionally hot tropical climates?* (London.)

If hermetically closed containers are used, it is essential that an efficient vacuum in the container is obtained. A vacuum of 8 in. should be taken as an absolute minimum. In order to obtain this vacuum, three methods are commonly used:

(*a*) The jam is filled into cans at not less than 180° F.; these are seamed, and immediately cooled.

(*b*) The cans are sterilised after seaming at 190° F. for 45-90 minutes according to size. After sterilisation, efficient cooling is essential.

(*c*) Vacuum seaming machines may be used which extract the air during the seaming operation.

Any of the aforesaid methods can be used alone or in combination. Other important points are the statutory soluble solid content and the correct balance of invert sugar and sucrose in the jam.

Information Supplied

The Enquiry Service has dealt with requests for the names of manufacturers and suppliers of plant, machinery, and materials, and also general information as follows:

B.4854. *Salted nuts.* (London.)

B.4856. *New Danish egg preserving method.* (London.)

B.4857. *Small smoking stoves.* (London.)

B.4859. *Bread rusk.* (London.)

B.4860. *Coffee essence.* (Ireland.)

B.4863. *Still lemonade and orangeade.* (Yorks.)

B.4864. *Plant for chicory and cereal mixes.* (London.)

B.4865. *Swiss apple storage silos.* (South Africa.)

B.4866. *Red cabbage shredding machines, and mixed pickling spices.* (Warwicks.)

B.4872. *Conservation of herring.* (South Africa.)

B.4873. *Table jellies.* (Som.)

B.4874. *Data for fish exporters.* (Holland.)

B.4875. *Maraschino cocktail cherries.* (London.)

B.4876. *Vacuum pumps for boiling sugar.* (Midlothian.)

B.4877. *Cough candy, supplies of soya flour, and marshmallow cream.* (London.)

B.4879. *Thick sauce.* (Ireland.)

B.4880. *Insulated containers.* (Ireland.)

B.4886. *Potato crisp manufacture.* (Warwicks.)

B.4887. *Machinery for cutting up nut kernels.* (Yorks.)

B.4890. *Machinery for shelling nuts, preparation of mashed potato powder, and production of potato crisps.* (South Africa.)

B.4891. *Medicated mints.* (Yorks.)

B.4892. *Hygiene posters for factories.* (Lanarks.)

B.4893. *Seals for capping bottles.* (Lancs.)

B.4894. *Processing of peel.* (London.)

B.4895. *Electric smoking kiln.* (Midlothian.)

B.4897. *Monosodium glutamate.* (Glos.)

B.4899. *German cold dessert powder.* (London.)

B.4900. *Stainless steel buckets.* (Lancs.)

B.4903. *Lactose B.P.* (Northumberland.)

B.4915. *Vacuum salt.* (London.)

B.4916. *Chloros.* (Yorks.)

B.4918. *Potato crisp manufacture.* (Essex.)

B.4921. *Electric hand driers.* (Ireland.)

B.4926. *"Smokeless" smoking kiln and machines for making ice cream cones.* (British West Indies.)

B.4928. *Bottle cleaning machines.* (Lancs.)

B.4929. *Hydrogen peroxide.* (South Africa.)

B.4930. *Powdered agar.* (Morayshire.)

B.4933. *Steam and water mixing valves.* (Surrey.)

B.4935. *Floor scrubbing machines.* (Glos.)

B.4938. *Collapsible tubes and tube filling machines.* (South Africa.)

B.4939. *Washing machines for bakers' trays, cooking utensils, etc.* (Warwicks.)

B.4942. *Biscuit cutters.* (Yorks.)

B.4943. *Smoking kiln.* (Channel Islands.)

Information Required

B.4936. *Names and addresses of suppliers of chocolate covered and/or marshmallow wafers free from points restrictions.* (Yorks.)

Recent Patents

647,894. FORKNER, J. C., and FORKNER, J. H.: Manufacture of fruit-containing products.
647,977. SOUTHERN INSTRUMENTS, LTD., SMITH, C. H. W. BROOKES-, and COLLS, J. A.: Bottling and like machinery.
647,979. HESSON, C. M.: Can arranging mechanism.
647,980. HESSON, C. M.: Can arranging conveyor mechanism.
648,017. DONOFRIO, A. M.: Packaging equipment.
648,030. GIBSON, L.: Implement for removing the caps of jars, bottles, tins, and like containers.
648,066. RAWSONS (LABELLING MACHINES), LTD., and RAWSON, F. C.: Magazines or label boxes for labelling machines.
648,138. VICARS, LTD., T. AND T., and WILDE, A. E.: Biscuit cutting and like machinery.

Abstract of a Recent Specification

Preparation of Coffee Extracts

This invention relates to the preparation of extracts from roasted and ground coffee and/or coffee substitutes such as roasted and ground barley and the like.

After the most concentrated extract has been removed from the last extractor filled with fresh prewetted coffee, and the concentration of the extract has fallen to about 10 to 25 per cent., a suitable quantity of such extract is removed for use in the prewetting of coffee to be filled in a following extractor. Then an extractor filled with fresh prewetted coffee is connected to the last extractor in the system, and the first extractor with exhausted coffee is disconnected.

A considerable advantage of this prewetting is that it is possible to obtain an extract of a concentration of 30 per cent. or more, at the same time as substantially all of the extractable matter is removed from the coffee. Furthermore, the prewetting results in a consistency of the coffee, which is more agreeable to handle. The coffee is less liable to clot and hence is more easily filled uniformly in the extractor, *i.e.* the risk of unsatisfactory flow of liquid through the coffee and other inconveniences, because of improper packing of the coffee in the extractor, is reduced.

The aqueous liquid used for the prewetting may be water, milk, sugar solutions, or the like, but it has been found that by far the best results are obtained by using a coffee extract of a comparatively high concentration of dry matter. A concentration of between 10 and 25 per cent. is considered the most convenient.

The above process may be applied to coffee obtained (as is usual) only by suitable grinding of the coffee beans. Further advantages may, however, be obtained when the coffee to be extracted is, by suitable grinding and subsequent separation, given a comparatively uniform size of particles. This can be obtained, for example, by adjusting the coffee mill so as to give a maximum size of particles corresponding to the desired upper size, and then by sieving or other separation.

By using a coffee of comparatively uniform size of particles, the extraction of the coffee is consequently made more uniform than by using coffee obtained as is usual, which is a mixture of particles of widely different size. Further, the pressure necessary for pressing the extracting liquid through the extraction system at the desired rate of flow can be held considerably lower when using coffee of a comparatively uniform size of particles. This may be of importance for the construction of the apparatus.

The temperature of the extracting medium may be varied, but because of the fact that certain constituents of the coffee, which are essential for the good taste and flavour of the extract, are heat-sensitive, such constituents should preferably be extracted at comparatively low temperature, conveniently about room temperature.

It has been found, however, that considerable advantage may be obtained when the coffee is first extracted substantially to remove heat-sensitive constituents in the coffee at a suitable low temperature, *i.e.* a temperature which will not badly injure such constituents, and then is extracted at a suitable increased temperature. The extraction at low temperature may conveniently take place at a temperature of between 15° and 30° C., and for the subsequent extraction, temperatures up to 60° to 90° C. or more may be regarded as convenient.

This procedure has been found to result in better yields and better taste of the extracts as well as reduction of the time required for the extraction of a given amount of coffee.

The resulting extract may be used as such or may be further concentrated in vacuum or brought to dry condition, preferably by spray drying or drying in vacuum. In order to inhibit the development of objectionable flavours in the extract due to oxidation or change on storage, a small amount of a non-toxic antioxidant may be incorporated in the coffee extract, *e.g.* by addition to the extracting liquid or to the final extract.
644,483. *Johan Ernst Nyrop and Aktieselskabet Niro Atomizer.*

Recent patents have been selected from the "Official Journal of Patents" and are published by permission of the Controller of H.M.S.O.

Trade Marks

DIAMINTS.—681,812. Boiled sugar confectionery (not medicated), toffee, and chocolate, all flavoured with mint. **Diamints, Limited,** 4, Leather Market Street, London, S.E.1; Manufacturers.
PARMINO.—682,671. Sauces; and cereal products for food for human use, but not including biscuits or any goods of the same description as biscuits. **Societa Anonima Althea** (a Joint Stock Company existing under the laws of Italy), 6, Viale Toschi, Parma, Italy; Manufacturers.
PANDURAL.—683,762. Chemical substances for preserving foodstuffs. **Aktieselskabet Ferrosan** (a Limited Liability Company duly organised under the laws of Denmark), 72, Blegdamsvej, Copenhagen, Denmark; Manufacturers.
PEZ.—686,367. Non-medicated sweets. **Eduard Haas (Senior),** trading as **Nahrmittelfabrik Ed. Haas,** 16, Waldeggstrasse, Linz on the Danube, Upper Austria; Manufacturer.

Trade marks have been selected from the "Official Trade Marks Journal" and are published by permission of the Controller of H.M.S.O.

New Companies

Cine Ices, Limited. (488500.) Somerset House, Temple Street, Birmingham, 2. To carry on business of general caterers, etc. Nom. cap.: £1,000 in £1 shares. Dirs.: A. Mendelssohn and Mrs. R. Mendelssohn, 117, Portland Road, Birmingham, 16; L. Cowen, 61, Kenilworth Court, Hagley Road, Birmingham.
Carlo's Milk Bars, Limited. (488532.) The offices of Benjamin, Kay, and Brummer, 315-7, Oxford Street, W.1. Nom. cap.: £4,000 in £1 shares. Dirs.: C. Ambrosini and Maria Ambrosini, 4, Milton Road, N.6; H. C. Ambrosini; and M. Donovan.
E. V. Wood and Company, Limited. (488626.) 6, Holborn Viaduct, E.C.1. To carry on business of butchers and meat dealers, etc. Nom. cap.: £1,000 in £1 shares. Dirs.: Mrs. F. M. Wood (permt.) and Miss E. M. Wood, The Shanty, Green Street, Ingatestone, Essex.
Garratt and Garratt, Limited. (489940.) Warwick Road, Hampton Wick, Kingston-on-Thames, Surrey. To carry on business of manufacturers of and dealers in foodstuffs, sweetmeats, and confectionery, etc. Nom. cap.: £10,000 in 10,000 redeemable preference shares of 10s. and 25,000 ordinary shares of 4s. Permt. dirs.: T. T. C. Garratt and Mrs. P. M. Garratt, Long Meadow, Clare Hill, Esher, Surrey.
Hudsons (Darwen), Limited. (489951.) To carry on business of bakers, manufacturers of and dealers in sugar, cake, and flour confection, etc. Nom. cap.: £1,000 in £1 shares. Dirs.: Not named. Subs.: J. Peet, 107, Newton Street, Southport (acct.); D. M. Stevenson, 13, Scarisbrick New Road, Southport (clk.).
James Epps and Company (Cocoa), Limited. (489954.) 15, Galleywall Road, Bermondsey, S.E.16. To take over business of James Epps and Company, Limited, and to carry on business of manufacturers of and dealers in cocoa, chocolate, etc. Nom. cap.: £2,000 in £1 shares. Dirs.: To be appointed by subs. Subs.: F. G. Rayman, 27, Meadow Road, Southall, Middx. (clk.); L. Musk, 17, Kimberley Road, Walthamstow, E.17 (clk.).
L. A. Van Lier and Company, Limited. (489963.) 66, Middlesex Street, E.1. To carry on business of importers of and dealers in potted, tinned, canned, and preserved goods and condiments, grocers, etc. Nom. cap.: £1,000 in £1 shares. Dirs.: L. A. Van Lier (permt.) and Mrs. H. Van Lier, Sarphatistraat 123, Amsterdam, Holland; P. Strongwater, 16, Hall Park Avenue, Chalkwell.
Warrington Meat Traders, Limited. (490027.) 18, Bold Street, Warrington, Lancs. Nom. cap.: £5,000 in £1 shares. Dirs.: R. Holland, 13, Menin Avenue, Warrington; J. E. Walker, The Bungalow, Nook Lane, Fearnhead, Warrington; F. T. Tunstall; G. Owen; G. Bowcock; and E. Pennington.
Hampers Food Products, Limited. (490282.) To carry on business of manufacturers of and dealers in potato crisps and processed potato specialities, etc. Nom. cap.: £3,000 in £1 shares. Dirs.: Not named. Subs.: Mrs. B. Stebbing, 41, Portland Gate, Portland Road, Hove, 3; Mrs. S. C. Roberts, 44, Gratwicke Road, Worthing.

Taken from the Daily Register, compiled by Jordan and Sons, Limited, Company Registration Agents, 116, Chancery Lane, London, W.C.2.